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16. Abstracts

The results of a statewide air emission inventory performed in the State of Alaska were presented. These results are intended to support the preparation of the State's air quality implementation plan. The data were obtained from a variety of sources including questionaires returned from industrial, commercial and governmental organization. The calculation of emission of particulates, SO_x, CO, hydrocarbons and NO_x from area sources and point sources representing emissions in excess of 5 tons per year, were performed. The report includes the following: description of the four air quality regions in Alaska; a summary and tabulation for each of the 5 pollutants for Anchorage, Fairbanks, and the air quality regions; data on fuel usage, fuel parameters, and refuse disposal rates and; a summary of the methodology used to identify emission sources.

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AIR EMISSION INVENTORY
STATE OF ALASKA

August 1971

Prepared for the
Environmental Protection Agency
Office of Air Programs

SYSTEMS GROUP OF TRW INC. • ONE SPACE PARK, REDONDO BEACH, CALIFORNIA 90278 • (213) 535-4321

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1.0 INTRODUCTION

Under statutory mandate, the Federal government is to promulgate national air quality standards for particulate matter, sulfur dioxide, carbon monoxide, hydrocarbons, nitrogen oxides, and photochemical oxidants. In turn, each state is required to prepare and submit a plan which provides for the implementation, maintenance and enforcement of such standards within each air quality control region of the state.

The work contained in this report represents the results of a statewide air emission inventory performed in the State of Alaska. These results are intended to support the preparation of the State's air quality implementation plan. The compilation of these data is the result of a three-month effort, undertaken by the Resources Research Laboratory of TRW Systems under contract to the Environmental Protection Agency (EPA) Air Programs-Region X and under the auspices of the Division of Environmental Health of the State of Alaska. The data were obtained from a variety of sources including over 200 questionnaires returned from various industrial, commercial and governmental organizations. The calculation of emission of particulates, SOX, CO, hydrocarbons and NOX from area sources and point sources representing emissions in excess of 5 tons per year, were performed using emission factors provided by the EPA.

The document is organized into five sections, including the introduction. Section 2.0 defines the boundaries of the four air quality regions in Alaska and briefly discusses their topography, climate, size of population and economic activity. Section 3.0 summarizes the findings of the survey in the form of pie charts and tabulations for each of the five pollutants for Anchorage, Fairbanks, and the air quality regions. (There are no county designations within the State of Alaska) Section 4.0 presents data on fuel usage, fuel parameters, and refuse disposal rates. Section 5.0 is a summary of the methodology used to identify emission sources; the basis for calculating emissions and data sources; and documents the necessary assumptions.

Variations in emissions can be expected to occur from year to year due to changes in the quantities of fuel used, shifting from one fuel to another, changes in industrial and commercial activities, changes in population and transportation patterns. The data presented in this report are intended to be valid for purposes of current planning and for establishing the basis for an air quality control strategy.

2.0 AREA DESCRIPTION

The State of Alaska is by far the largest state in the Union, having a total area of 586,000 square miles. Much of the population, 302,000 by the 1970 census, is centered in two areas: Anchorage and Fairbanks, with lesser totals in the Southeastern region in cities such as Juneau and Ketchikan. The state has been divided into four air quality regions. These regions have been defined as follows:

Cook Inlet Intrastate Air Quality Control Region (#008)

> Greater Anchorage Area Borough
> Kenai Peninsula Borough
> Matanuska-Susitna Borough

Northern Alaska Intrastate Air Quality Control Region (#009)

> Those portions of the 1956 Election Districts 18-23, inclusive, as described in Article XIV, section 3 of the Constitution of the State of Alaska, which are not included in the designated Cook Inlet Intrastate Air Quality Control Region as designated August 12, 1970, (35 F. R. 12757).

South Central Alaska Intrastate Air Quality Control Region (#010)

> Those portions of the 1956 Election Districts 7-17, inclusive, and Election District 24 as described in Article XIV, section 3 of the Constitution of the State of Alaska, which are not included in the designated Cook Inlet Intrastate Air Quality Control Region as designated August 12, 1970 (35 F. R. 12757).

Southeastern Alaska Intrastate Air Quality Control Region (#011)

> 1956 Election Districts 1-6, inclusive, as described in Article XIV, section 3 of the Constitution of the State of Alaska.

The geographical boundaries of each air quality region are presented graphically in figure 1.

FIGURE 1. AIR QUALITY REGIONS OF ALASKA

2.1 COOK INLET INTRASTATE AIR QUALITY CONTROL REGION

This region incorporates the Greater Anchorage area containing a population of 124,500, more than half of whom live within the Anchorage city limits. The remainder resides in the Kenai Peninsula in the South and the Matanushka-Susitna area in the North. The area has a locally-organized air pollution control district. Nearby Elmendorf Air Force Base provides a major source of economic activity for the Anchorage area. Anchorage is also a key commercial center for air travel and serves Alaskan, U.S. domestic, as well as Orient and Europe-bound foreign airlines operating over polar routes. Anchorage acts as a commerce and service center for a large area encompassing the Matanuska Valley and extending to the Bristol Bay and Prince William Bay areas.

The city of Kenai (population 6000) is the seat of a rapidly developing oil industry. The Kenai Peninsula and the Cook Inlet region have a number of producing on-shore and off-shore oil and natural gas facilities. Two "topping refineries" and an ammonia/urea producing plant are located here. Further to the south, the city of Homer (area population 2750) is an agricultural and fishing community. Other similar centers of population in this region include Seldovia, Palmer, Soldatna, Whittier, and Seward, the principal access port of the Alaskan Railroad.

The region is protected from Arctic weather patterns by the Alaska mountain range paralleling the coast. The number of annual degree days for the Cook Inlet region is in the range of 10700 - 11600 (reference 1).

2.2 NORTHERN ALASKA INTRASTATE AIR QUALITY CONTROL REGION

This region encompasses Alaska's interior and Arctic regions. The Interior region spans a huge area between the Alaska and Brooks Mountain ranges. It extends east and west from the Alaska-Canada border almost to the Bering Sea. The Yukon River and its tributaries flow hundreds of miles through the Interior to the Bering Sea. Native villages dot the riverside along its full length.

Fairbanks, Alaska's second largest city, contains an area population of 45,900. It is a terminus of the Alaska Railroad, and of the Alaska, Steese and Richardson Highways. The city is an important air transportation center with almost one-third of the military forces stationed in Alaska located at two large installations nearby. The University of Alaska is located a few miles outside the city limits.

The city is located on a wide river plain with low-lying hills immediately to the north. The area is subject to persistent inversion during both summer and winter months. It is during these inversion periods that pollutant (particulates, CO, NOX, and HC) concentrations become high during the summer. Ice-fog conditions develop during the winter for extended periods. The area is subject to a wide variation of temperature and weather conditions. During the summer, temperatures between 80°F and 100°F are not uncommon for prolonged periods without rain. During the winter, temperatures will often range between -30°F and -60°F. The number of annual degree days for the region is the range of 13,700 - 14,3000.

Long famous as a gold-producing center, the Interior today holds promise for a number of other minerals such as copper, coal, lead, zinc, silver and nickel, that are drawing the attention of the mining industry. The state's only producing coal mines are located in this area. Other principal towns and villages within the Interior are Nenana, Ft. Yukon, Big Delta, Tok Junction, North Pole, and College.

The Arctic region is mountainous, rolling tundra country, barren and treeless, extending to the Arctic Ocean. The coasts are ice-locked from seven to eight months of the year. The exploration for petroleum (North Slope) is in progress and even today the city of Barrow, northern-most community in the nation, is heated by natural gas. Deposits of coal and copper are being explored.

The climate in the Arctic region is extreme. Winter temperatures average about 17 degrees below zero and climb to an average of only 40 degrees in the summer. During the two months of summer in which the sun never sets, agriculture is possible. In the winter, two months of perpetual darkness occur when the sun never gets above the horizon. The number of annual degree days in the Arctic region is in the range of 16100 - 20200.

Principal cities are Kotzebue (population 1,740) and Barrow (population 2,660). The economy is based on tourism, and the exploration for extractive natural resources.

No roads lead to the Arctic, but considerable air traffic is provided from Fairbanks and Anchorage.

2.3 SOUTH CENTRAL ALASKA INTRASTATE AIR QUALITY REGION

This region encompasses a portion of Western Alaska, Southwest Alaska (the Aleutians) and South Central Alaska.

Western Alaska extends to the waters of the Bering Sea and includes the Seward Peninsula, Norton Sound, the Yukon-Kuskokwim Delta, the Bristol Bay region, and islands in the Bering Sea.

Commercial fishing plays a vital part in the economy of Western Alaska, particularly in the Bristol Bay and Kuskokwim Bay areas as well as the Yukon's delta in Norton Sound.

Nome (population 5,750) known as a turn-of-the-century gold rush tent city, today serves as a major tourist attraction and as the trade and distribution center of the Seward Peninsula.

Bethel, 290 miles southeast of Nome, is another key community in Western Alaska. On the banks of the Kuskokwin River, nearly 90 miles from the sea, this service community of 7,600 provides educational and medical facilities for an additional 7,000 people in outlying villages.

Dillingham (population 800), lying 17 miles south and east of Bethel on Bristol Bay, is the state's major salmon fishing ground.

High winds and high humidity mark the winters in Western Alaska, while cool, rainy and foggy weather prevails in the summer. The number of annual degree days is in the range of 13,200 - 14,200.

Southwest Alaska includes the Alaska Peninsula, Kodiak Island group and the Aleutian chain, extending 2000 miles westward. The largest volcanic chain on the continent is located here.

Kodiak (area population 10,000) is the largest town in this region and has undergone considerable growth in recent years. It is the scene of major salmon and halibut activity. 1966 figures placed Kodiak as the third largest fish landing port in the United States.

The climate of Southwest Alaska is milder than that of Western Alaska. The number of degree days is in the range of 8880 - 11,200.

Southcentral Alaska, located east of the Cook Inlet Air Quality Region consists primarily of small mining and fishing communities. Valdez (area population 1500) is the seaport terminus for the Richardson Highway leading to Fairbanks. Cordova (population 1800) is a major fishing port and is one of Alaska's potential coal producing areas. The timber stands of the Chugach National Forest, as yet virtually untapped, promise to provide an additional economic base for the area. The annual degree days for this region fall in the range of 9000 - 9700.

2.4 SOUTHEASTERN ALASKA INTRASTATE AIR QUALITY REGION

Southeast Alaska is 600 miles from the major population center of the Pacific Northwest. The region consists of several major islands, thousands of smaller islands, and a thin strip of mainland bounded on one side by Canada and on the other by the Pacific Ocean. This land area approximates the size of the state of Maine. Ferries of the Alaska Marine Highway System serve to interconnect the major cities of the area. The only other modes of intercity transportation involve scheduled airlines and small amphibious aircraft.

The population is engaged primarily in fishing, lumbering, pulp manufacturing, and tourism. The bulk of Alaska's pulp and lumber activities are in this area; forests of spruce and hemlock cover most of the islands.

Ketchikan (area population 11,000) has as its main industries salmon fishing and processing, cold storage facilities, tourism, logging and lumbering. It is the site of one of the state's large pulp mills.

The Wrangell/Petersburg (area population 4,500) area is Southeast Alaska's lumber-producing center. Other industries in Wrangell are crab, shrimp and fish processing and tourism.

Sitka (area population 7,800) is the site of major pulp manufacturing, logging, and fish processing.

Juneau (area population 13,500) is Alaska's state capital. Situated between towering mountains, Juneau acts as a harbor and air terminal link with Seattle.

Haines (area population 1,500) is the northern terminus of the Alaska Marine Highway System and the southern terminus of the Haines Highway leading into the Candian Yukon. Lumbering, logging, native arts, and fishing are its major industries.

Skagway (area population 700), a living memorial to the Klondike Gold Rush, is a transporation center and railhead for freight movements to the Yukon Territory.

This part of Alaska has a mild marine climate. Temperatures seldom drop to less than 10 degrees above zero in the winter and range in the sixties and seventies in the summer. Annual rainfall varies from 25 to 155 inches. The annual degree days in this area fall in the range of 7000-9200.

TABLE 1. SUMMARY OF TOTAL ANNUAL EMISSIONS

AIR QUALITY REGION	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
ANCHORAGE	2626	3017	108,044	29,637	22,085
FAIRBANKS	14,925	5105	35,182	7451	14,335
008	3599	3517	120,157	50,271	77,475
009	52,143	7521	40,731	10,801	29,018
010	16,799	1867	17,523	4863	11,537
011	3891	6093	37,191	5827	5436
STATE TOTAL	76,432	18,998	215,602	71,762	123,466

NOTE: Numbers in this table include emissions from forest fires. Other than this table and Table 12, no tables or figures in this report include emissions from forest fires.

TABLE 2. SUMMARY OF ANNUAL EMISSIONS FROM FUEL COMBUSTION
ANCHORAGE
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SOURCES

SOURCE TYPE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
RESIDENTIAL	167	185	113	57	343
COMMERCIAL/INSTITUTIONAL	155	55	97	51	601
INDUSTRIAL	303	144	88	258	2537
TOTAL	625	384	298	366	3481

NOTE: In Tables 2 through 7, the Industrial category includes power plants.

TABLE 3. SUMMARY OF ANNUAL EMISSIONS FROM FUEL COMBUSTION
FAIRBANKS
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SOURCES

SOURCE TYPE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
RESIDENTIAL	450	437	752	208	252
COMMERCIAL/INSTITUTIONAL	1653	2479	1193	350	2141
INDUSTRIAL	1869	741	340	112	3878
TOTAL	3972	3657	2285	670	6271

TABLE 4. SUMMARY OF ANNUAL EMISSIONS FROM FUEL COMBUSTION
AIR QUALITY REGION 008
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SOURCES

SOURCE TYPE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
RESIDENTIAL	213	235	143	72	436
COMMERCIAL/INSTITUTIONAL	183	67	114	60	741
INDUSTRIAL	1034	258	453	2164	55,231
TOTAL	1430	560	710	2296	56,408

TABLE 5. SUMMARY OF ANNUAL EMISSIONS FROM FUEL COMBUSTION
AIR QUALITY REGION 009
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SOURCES

SOURCE TYPE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
RESIDENTIAL	499	504	779	224	327
COMMERCIAL/INSTITUTIONAL	1713	2631	1665	450	2724
INDUSTRIAL	1910	769	399	129	4029
TOTAL	4122	3904	2843	803	7080

TABLE 6. SUMMARY OF ANNUAL EMISSIONS FROM FUEL COMBUSTION
AIR QUALITY REGION 010
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SOURCES

SOURCE TYPE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
RESIDENTIAL	85	128	45	26	112
COMMERCIAL/INSTITUTIONAL	255	389	1529	332	2040
INDUSTRIAL	109	107	446	101	699
TOTAL	449	624	2020	459	2851

TABLE 7. SUMMARY OF ANNUAL EMISSIONS FROM FUEL COMBUSTION
AIR QUALITY REGION 011
RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SOURCES

SOURCE TYPE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
RESIDENTIAL	103	162	51	31	123
COMMERCIAL/INSTITUTIONAL	33	46	3	47	127
INDUSTRIAL	1575	233	13,062	1228	937
TOTAL	1711	441	13,116	1306	1187

TABLE 8. ANNUAL EMISSION FROM SOLID WASTE DISPOSAL

AIR QUALITY REGION	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
ANCHORAGE	0	0	0	0	0
FAIRBANKS	582	39	2749	971	205
008	0	0	0	0	0
009	740	57	3504	1262	265
010	406	24	2148	758	150
011	1715	31	5950	1085	177
STATE TOTAL	2861	112	11,602	3105	592

TABLE 9. SUMMARY OF ANNUAL EMISSIONS FROM AUTOMOTIVE GASOLINE AND DIESEL TRAFFIC

AIR QUALITY REGION	SOURCE	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
ANCHORAGE	GASOLINE	222	135	88,972	13,776	6314
	DIESEL	854	1536	11,097	2219	11,609
FAIRBANKS	GASOLINE	58	35	23,323	3611	1655
	DIESEL	173	312	2253	451	2357
008	GASOLINE	246	149	98,564	15,262	6995
	DIESEL	982	1768	12,768	2554	13,357
009	GASOLINE	60	36	23,870	3696	1694
	DIESEL	177	318	2298	460	2404
010	GASOLINE	16	10	6340	982	450
	DIESEL	105	189	1363	273	1426
011	GASOLINE	30	18	11,966	1853	849
	DIESEL	195	350	2530	506	2647
STATE TOTAL	GASOLINE	352	213	140,740	21,793	9988
	DIESEL	1459	2625	18,959	3793	19,834

TABLE 10. ANNUAL EMISSIONS FROM AIRCRAFT

AIR QUALITY REGION	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
ANCHORAGE	877	925	7106	1714	524
FAIRBANKS	285	469	3794	737	151
008	883	987	7475	1727	530
009	295	562	4353	756	161
010	104	109	757	241	52
011	109	216	1390	251	60
STATE TOTAL	1391	1874	13,975	2975	803

TABLE 11. ANNUAL EMISSION FROM RAILROADS

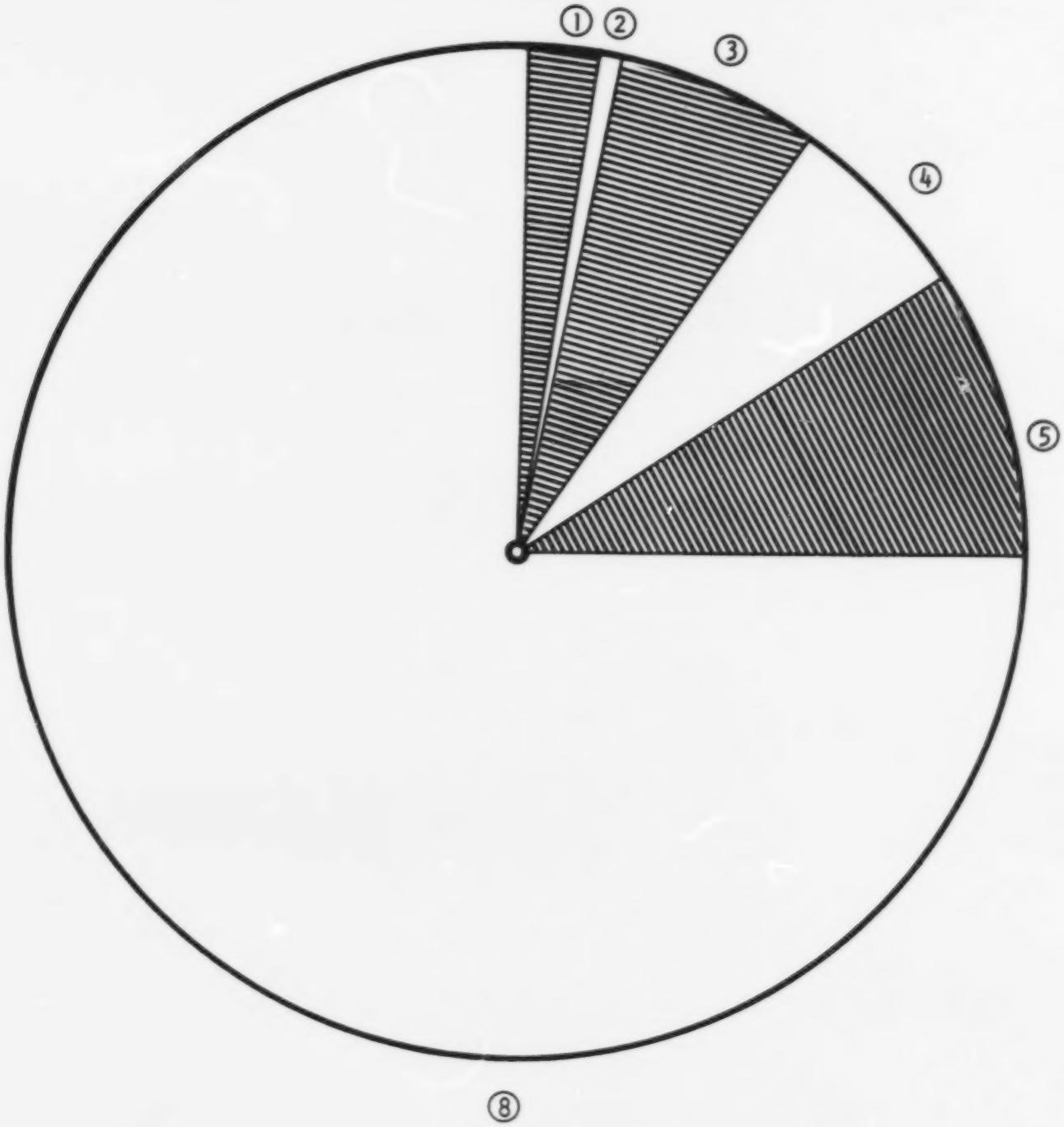
AIR QUALITY REGION	PARTICULATES TONS/YR	SOX TONS/YR	CO TONS/YR	HYDROCARBONS TONS/YR	NOX TONS/YR
ANCHORAGE	12	31	34	24	36
FAIRBANKS	18	46	49	35	53
008	18	46	49	35	53
009	18	46	49	35	53
010	0	0	0	0	0
011	3	9	9	7	10
STATE TOTAL	39	101	107	77	116

TABLE 12. SUMMARY OF COMPONENT ANNUAL EMISSIONS BY AREA SOURCES

TABLE 12. SUMMARY OF COMPONENT ANNUAL EMISSIONS BY AREA SOURCES

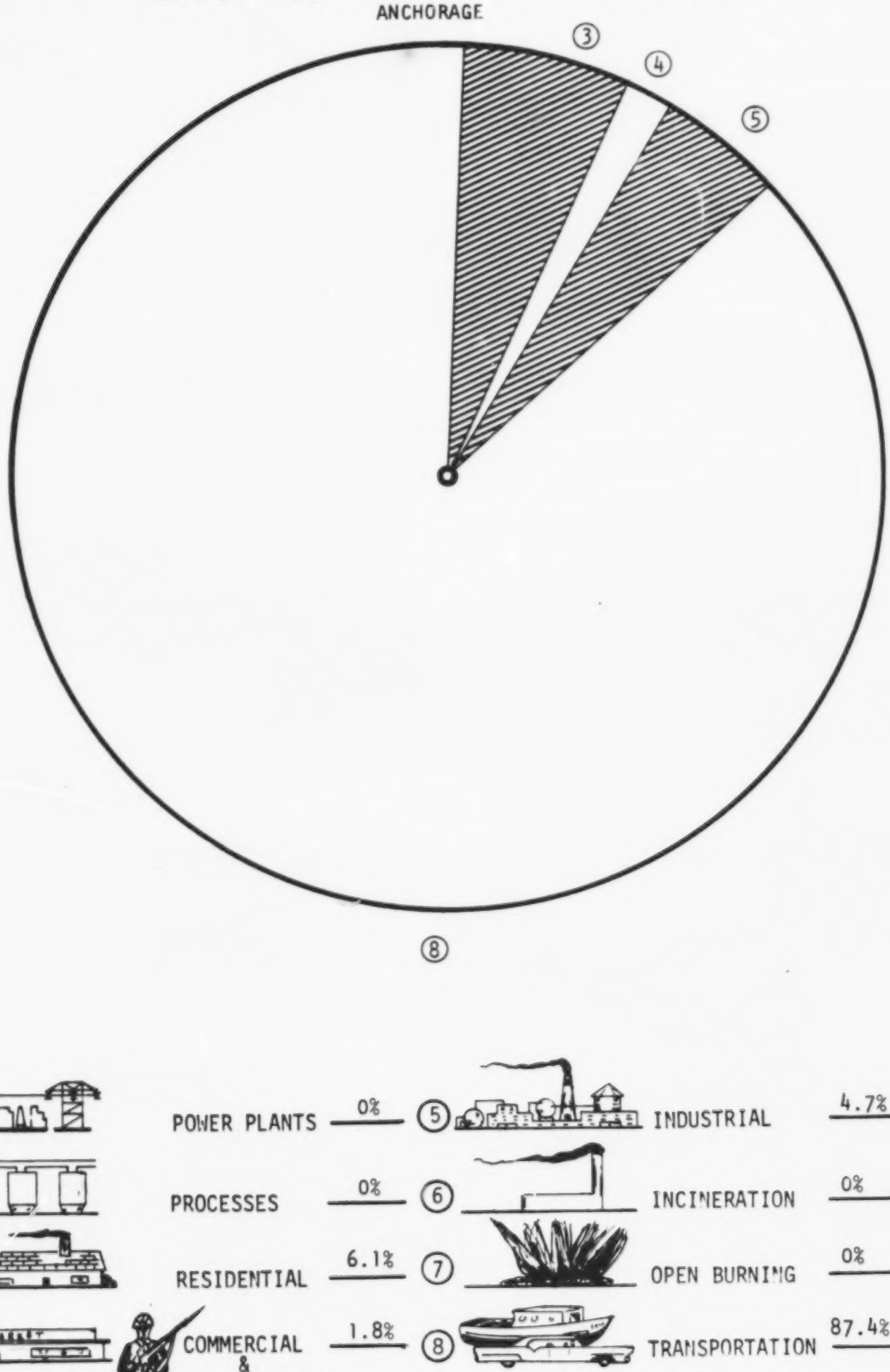
EMISSION SOURCE		ANCHORAGE	FAIRBANKS	AIR QUALITY REGION 008	AIR QUALITY REGION 009	AIR QUALITY REGION 010	AIR QUALITY REGION 011	STATE TOTAL
RESIDENTIAL FUEL	P	167	450	213	499	85	103	900
	SOX	185	437	235	504	129	162	1029
	CO	113	752	143	779	45	51	1018
	HC	57	208	72	224	26	31	353
	NOX	343	252	436	327	112	123	998
COMMERCIAL & INSTITUTIONAL FUEL	P	134	384	160	386	24	33	603
	SOX	53	285	63	260	24	46	393
	CO	85	833	102	833	0	3	938
	HC	45	203	52	204	4	47	307
	NOX	521	151	626	161	92	127	1006
INDUSTRIAL FUEL	P	211	67	275	97	65	120	557
	SOX	127	42	165	62	45	75	347
	CO	2	0	3	1	0	1	5
	HC	31	9	40	14	10	18	82
	NOX	611	200	795	290	202	354	1641
FOREST FIRES	P	0	9837	0	46,727	15,576	0	62303
	SOX	0	547	0	2,596	865	0	3461
	CO	0	729	0	3,461	1,154	0	4615
	HC	0	729	0	3,461	1,154	0	4615
	NOX	0	3643	0	17,306	5,769	0	23075
OPEN BURNING	P	0	474	0	604	142	373	1119
	SOX	0	30	0	38	9	23	70
	CO	0	2510	0	3210	757	1983	5950
	HC	0	989	0	1133	267	710	2100
	NOX	0	176	0	227	53	140	420
INCINERATOR	P	0	23	0	29	0	18	47
	SOX	0	5	0	6	0	4	10
	CO	0	33	0	42	0	26	67
	HC	0	10	0	13	0	8	21
	NOX	0	10	0	13	0	8	21
SOLVENT EVAPORATION	HC	169	71	200	90	50	60	409
DIESEL VESSELS	P	18	0	20	3	128	79	230
	SOX	5	0	6	1	37	23	67
	CO	48	0	53	7	333	204	597
	HC	37	0	41	6	257	157	461
	NOX	54	0	59	8	374	230	671
GASOLINE VESSELS	P	2	0	2	1	15	9	27
	SOX	1	0	1	1	9	5	16
	CO	489	0	538	48	3408	2026	6110
	HC	74	0	81	52	513	305	951
	NOX	67	0	73	47	465	276	861
RAILROADS	P	12	18	18	18	0	3	39
	SOX	31	46	46	46	0	9	101
	CO	34	49	49	49	0	9	107
	HC	24	35	35	35	0	7	77
	NOX	36	53	53	53	0	10	116
DIESEL MOTOR VEHICLES	P	954	173	982	177	105	195	1459
	SOX	1536	312	1768	318	189	350	2675
	CO	11097	2253	12768	2298	1363	2530	18959
	HC	2219	451	2554	460	273	506	3793
	NOX	11609	2357	13357	2404	1426	2647	19834
GASOLINE MOTOR VEHICLES	P	222	58	246	60	16	30	352
	SOX	135	35	149	36	10	18	213
	CO	88972	23323	98664	23870	6340	11966	140740
	HC	13776	3611	15282	3696	982	1853	21793
	NOX	6314	1655	6935	1694	450	849	9988
SMALL AIRCRAFT	P	55	37	61	47	7	16	131
	SOX	552	372	614	465	68	165	1312
	CO	3313	2233	3682	2792	407	988	7869
	HC	110	74	123	93	14	33	263
	NOX	55	37	61	47	7	16	131
GASOLINE MARKETING	HC	668	176	740	180	40	100	1060

FIGURE 2. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
ANCHORAGE



①	POWER PLANTS	2.3%	⑤	INDUSTRIAL	9.2%
②	PROCESSES	0.6%	⑥	INCINERATION	0%
③	RESIDENTIAL	6.4%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	5.9%	⑧	TRANSPORTATION	75.6%

FIGURE 3. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
ANCHORAGE



① POWER PLANTS	0%	⑤ INDUSTRIAL	4.7%
② PROCESSES	0%	⑥ INCINERATION	0%
③ RESIDENTIAL	6.1%	⑦ OPEN BURNING	0%
④ COMMERCIAL & INSTITUTIONAL	1.8%	⑧ TRANSPORTATION	87.4%

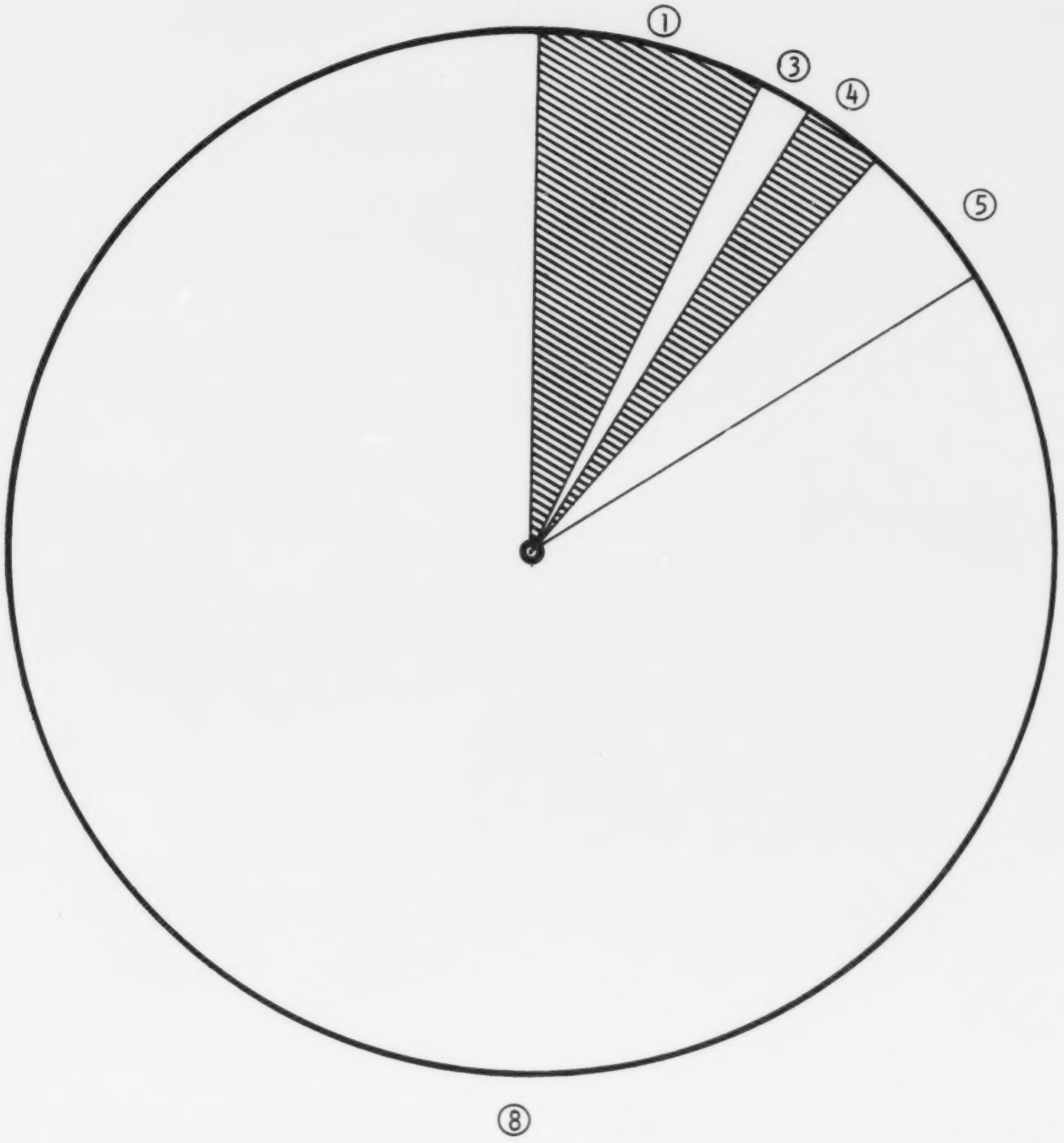
FIGURE 4. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
ANCHORAGE

①	POWER PLANTS	0%	⑤	INDUSTRIAL	0.1%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	0.1%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	0.1%	⑧	TRANSPORTATION	99.7%

FIGURE 5. ANNUAL HYDROCARBON EMISSIONS BY SOURCE CATEGORY
ANCHORAGE

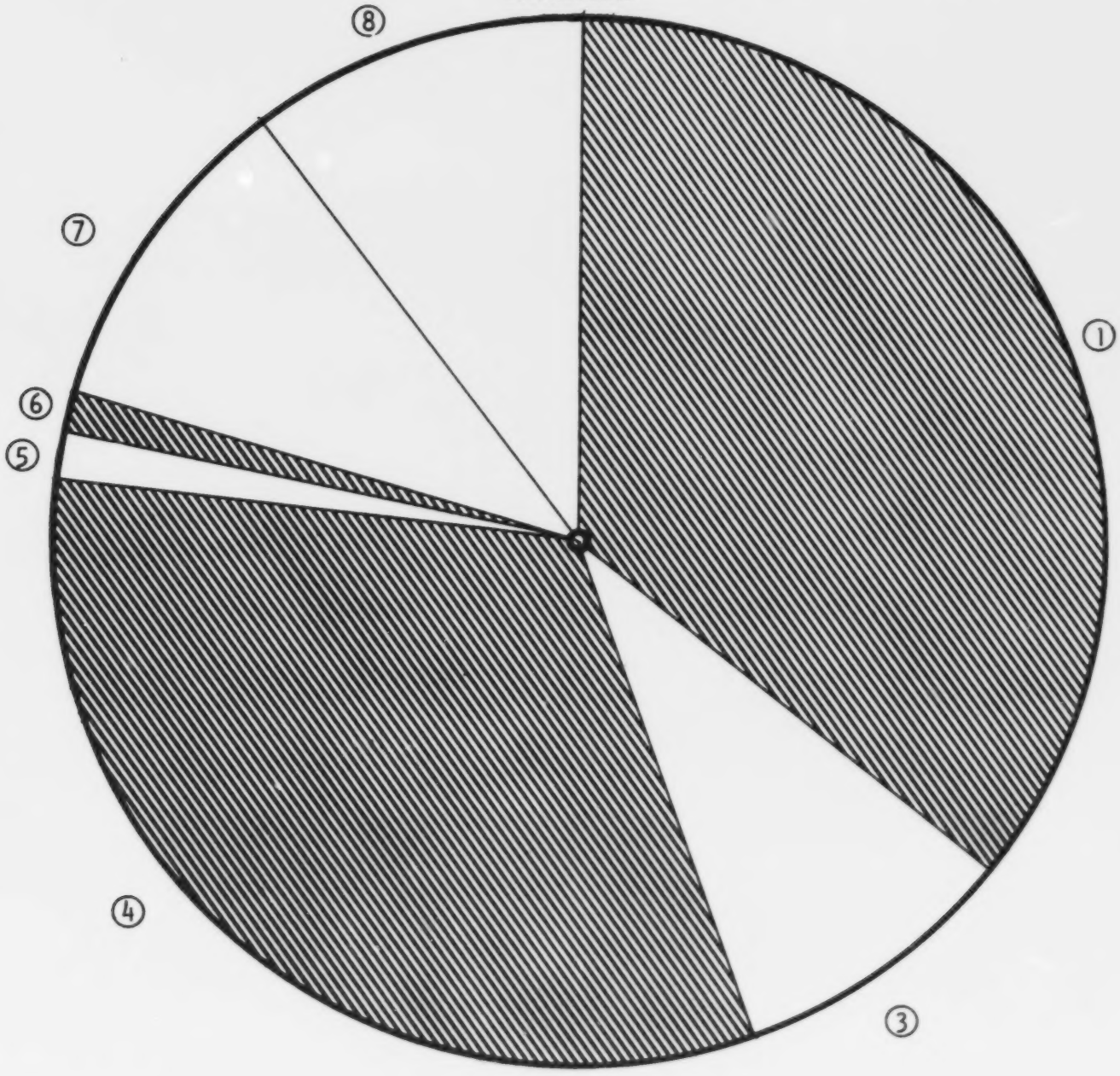
①	POWER PLANTS	0.5%	⑤	INDUSTRIAL	0.9%
②	PROCESSES	35.7%	⑥	INCINERATION	0%
③	RESIDENTIAL	0.2%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	0.2%	⑧	TRANSPORTATION	62.5%

FIGURE 6. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
ANCHORAGE



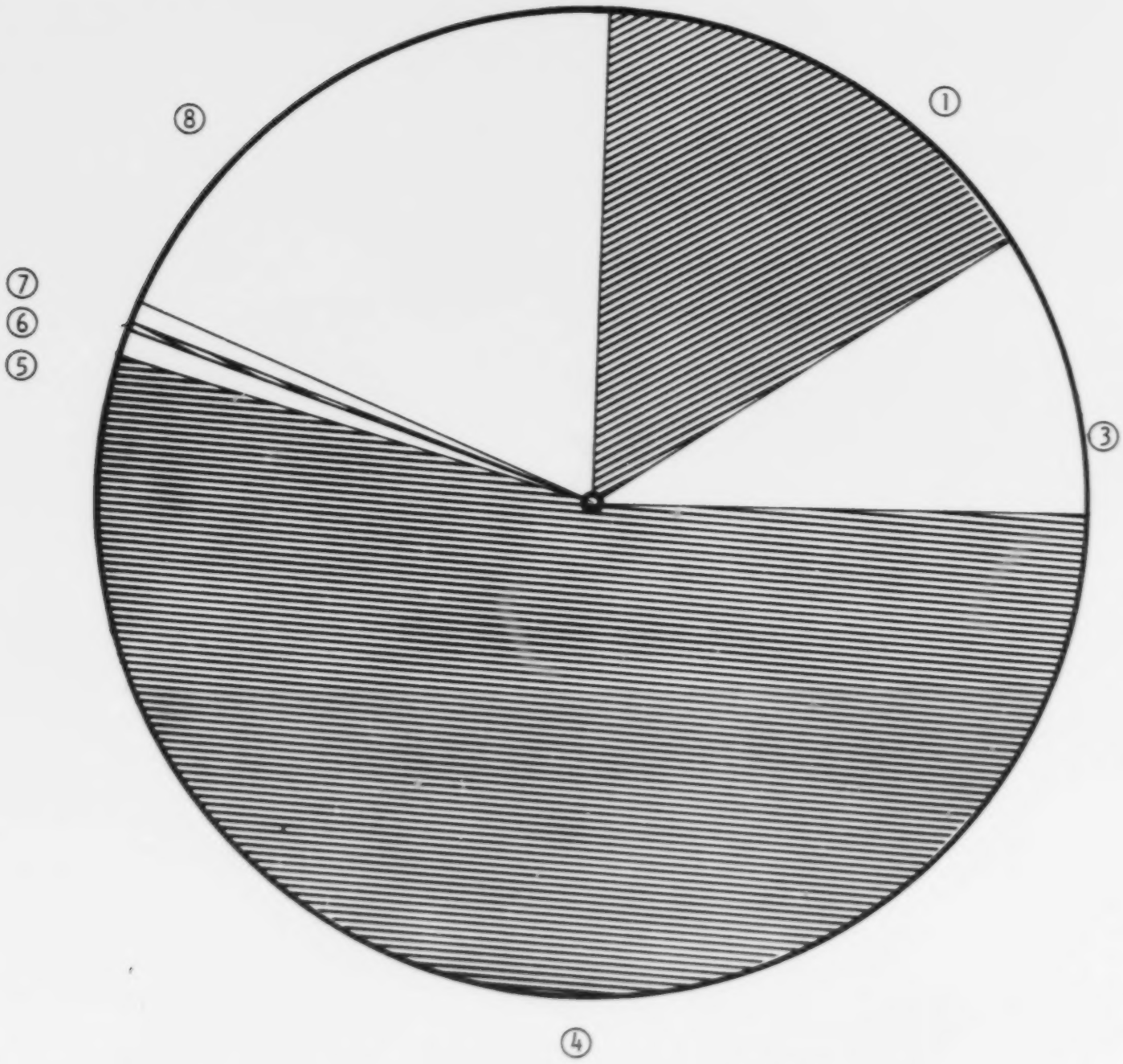
①	POWER PLANTS	6.9%	⑤	INDUSTRIAL	4.6%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	1.6%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	2.7%	⑧	TRANSPORTATION	84.2%

FIGURE 7. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
FAIRBANKS



①	POWER PLANTS	35.5%	⑤	INDUSTRIAL	1.3%
②	PROCESSES	0%	⑥	INCINERATION	1.4%
③	RESIDENTIAL	8.8%	⑦	OPEN BURNING	10.0%
④	COMMERCIAL & INSTITUTIONAL	32.5%	⑧	TRANSPORTATION	10.5%

FIGURE 8. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
FAIRBANKS

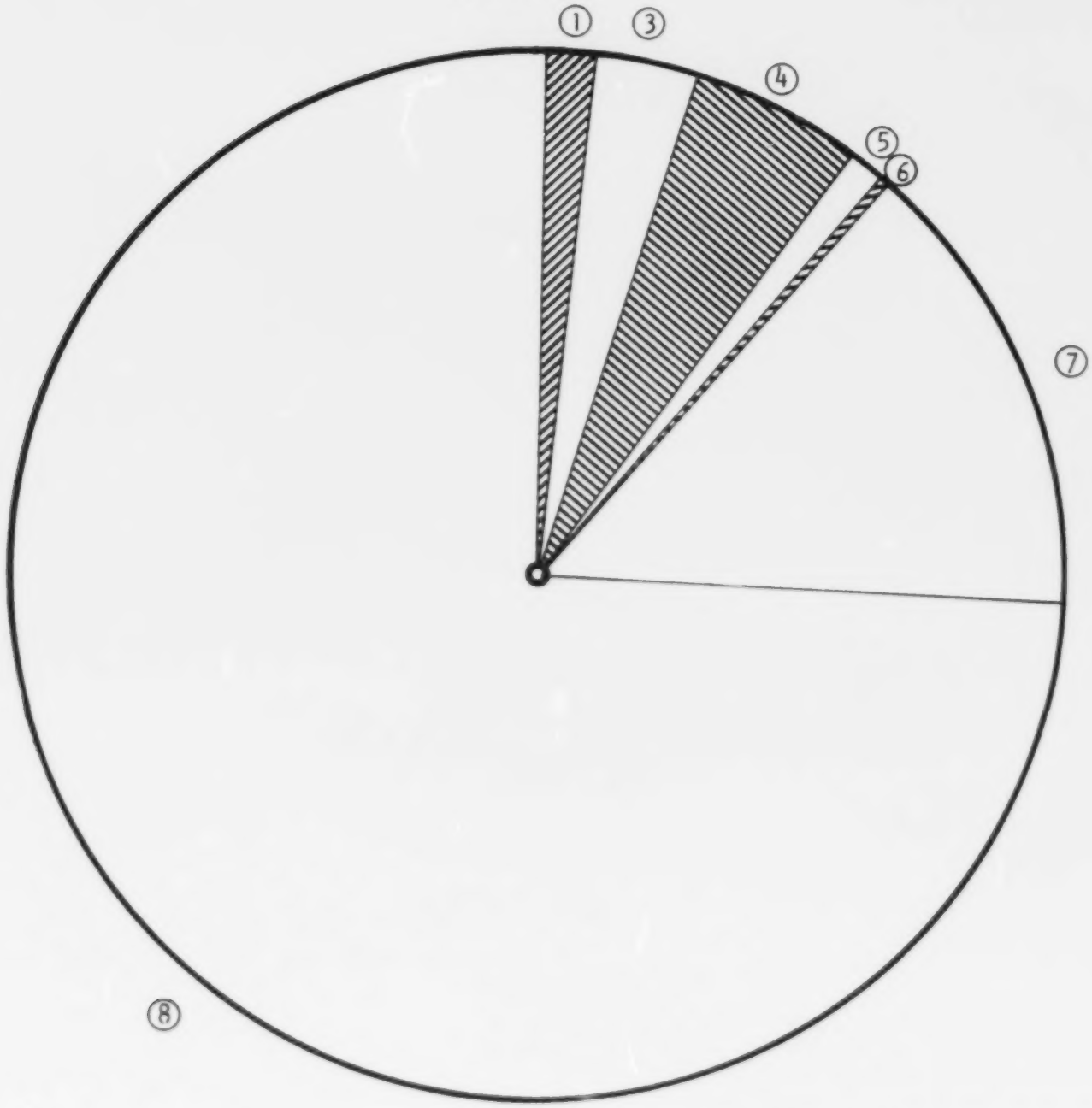


①	POWER PLANTS	15.3%	⑤	INDUSTRIAL	0.9%
②	PROCESSES	0%	⑥	INCINERATION	0.2%
③	RESIDENTIAL	9.6%	⑦	OPEN BURNING	0.7%
④	COMMERCIAL & INSTITUTIONAL	54.4%	⑧	TRANSPORTATION	18.9%

FIGURE 9. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
FAIRBANKS

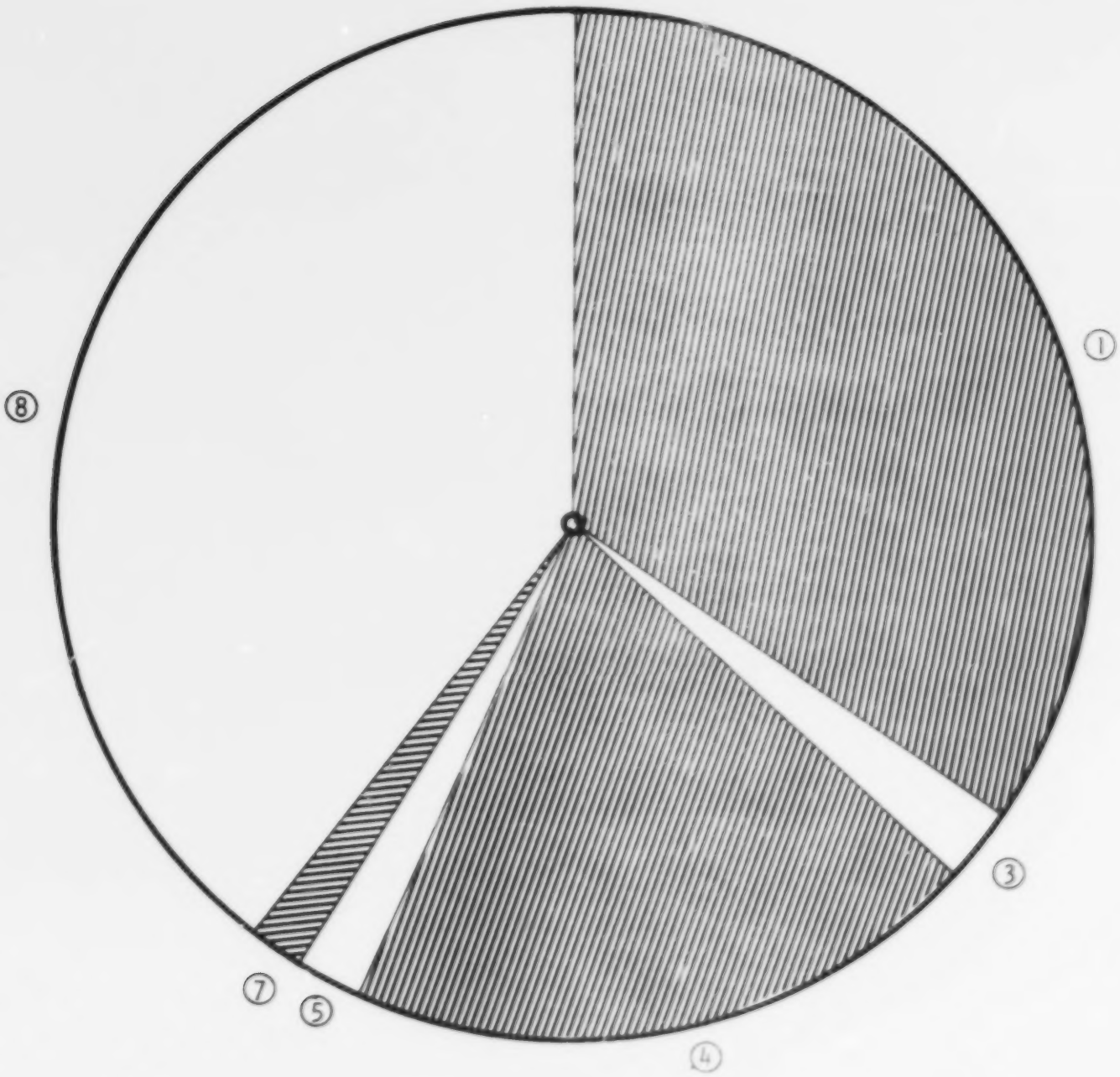
①	POWER PLANTS	1.0%	⑤	INDUSTRIAL	0%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	2.2%	⑦	OPEN BURNING	7.9%
④	COMMERCIAL & INSTITUTIONAL	3.5%	⑧	TRANSPORTATION	85.4%

FIGURE 10. ANNUAL HYDROCARBON EMISSIONS BY SOURCE CATEGORY
FAIRBANKS



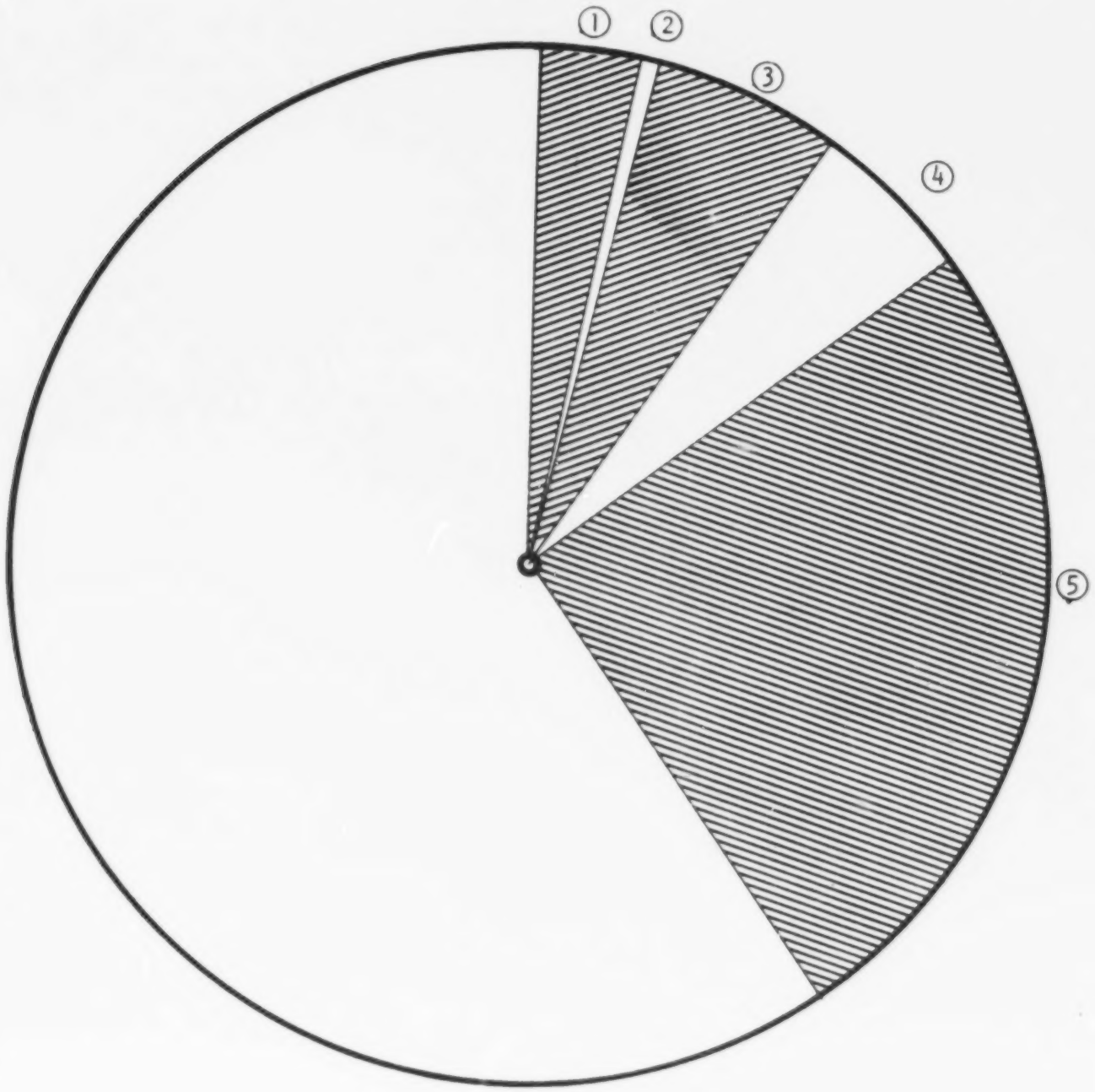
①	POWER PLANTS	1.5%	⑤	INDUSTRIAL	1.2%
②	PROCESSES	0%	⑥	INCINERATION	0.2%
③	RESIDENTIAL	3.1%	⑦	OPEN BURNING	14.3%
④	COMMERCIAL & INSTITUTIONAL	5.2%	⑧	TRANSPORTATION	74.5%

FIGURE 11. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
FAIRBANKS



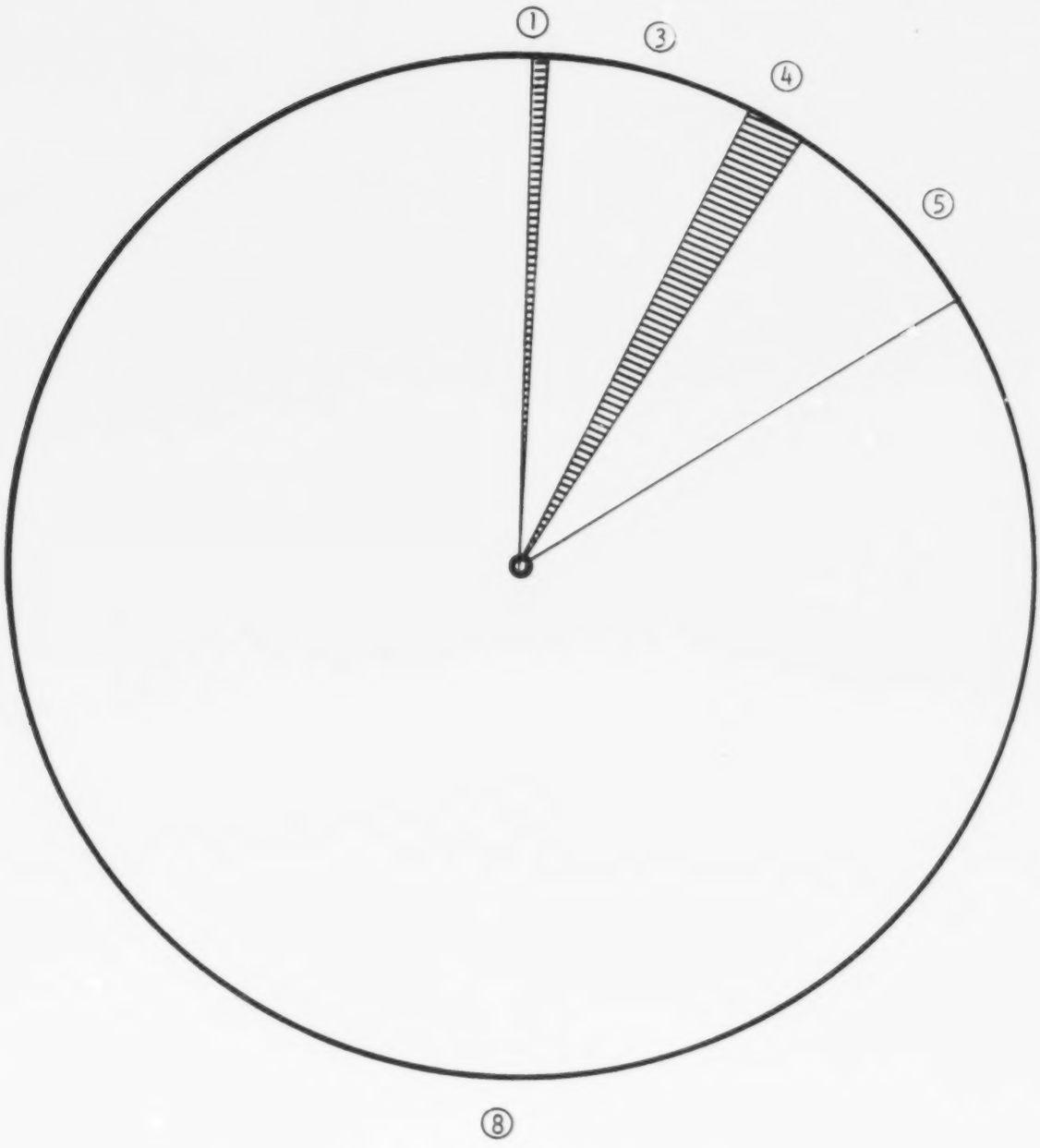
①	POWER PLANTS	34.4%	⑤	INDUSTRIAL	1.9%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	2.4%	⑦	OPEN BURNING	1.8%
④	COMMERCIAL & INSTITUTIONAL	20%	⑧	TRANSPORTATION	39.5%

FIGURE 12. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 008



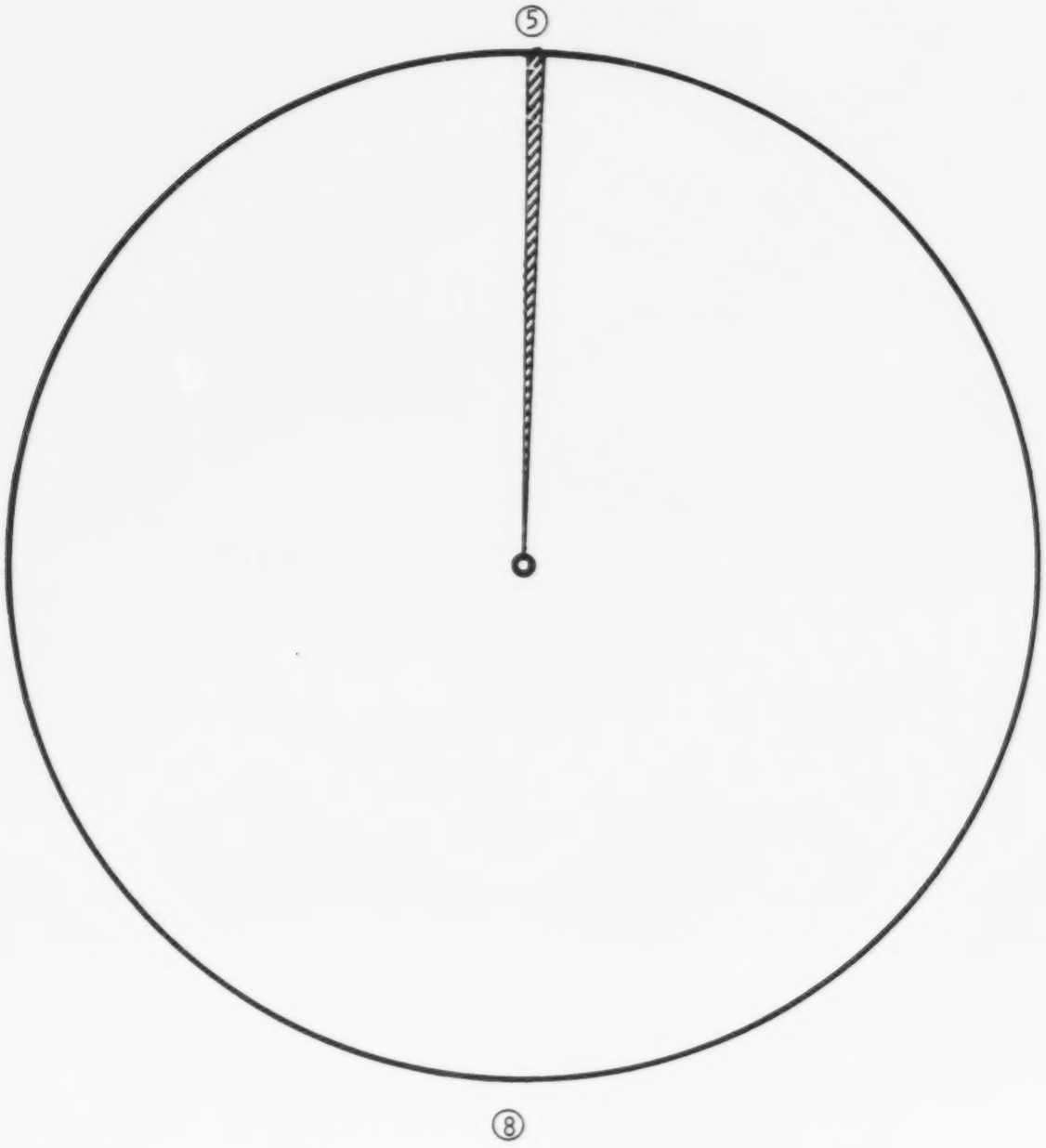
①	POWER PLANTS	3.1%	⑤	INDUSTRIAL	25.6%
②	PROCESSES	0.5%	⑥	INCINERATION	0%
③	RESIDENTIAL	5.9%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	5.1%	⑧	TRANSPORTATION	59.8%

FIGURE 13. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 008



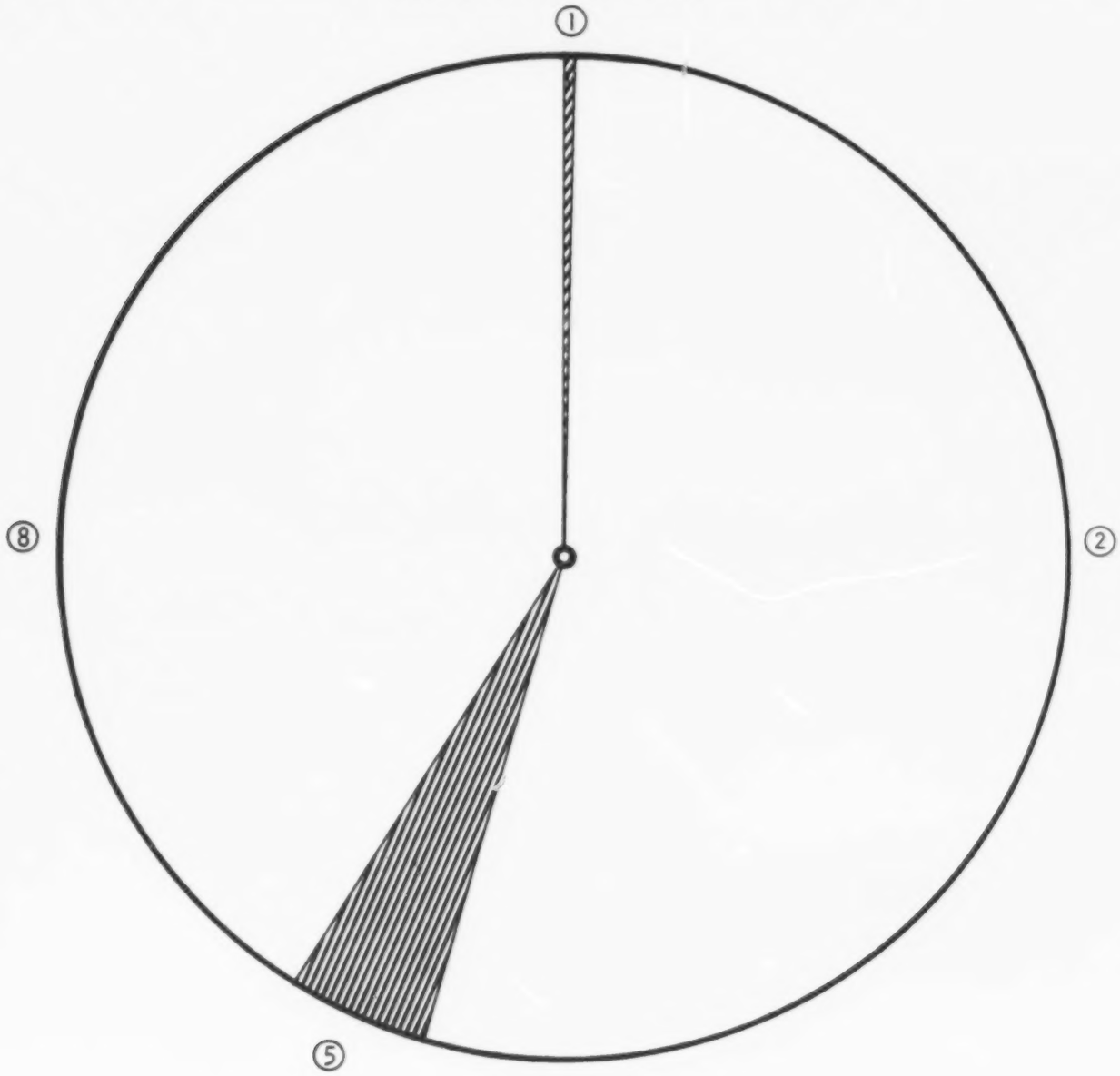
① POWER PLANTS	0.3%	⑤ INDUSTRIAL	7.0%
② PROCESSES	0%	⑥ INCINERATION	0%
③ RESIDENTIAL	6.7%	⑦ OPEN BURNING	0%
④ COMMERCIAL & INSTITUTIONAL	1.9%	⑧ TRANSPORTATION	84.1%

FIGURE 14. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 008



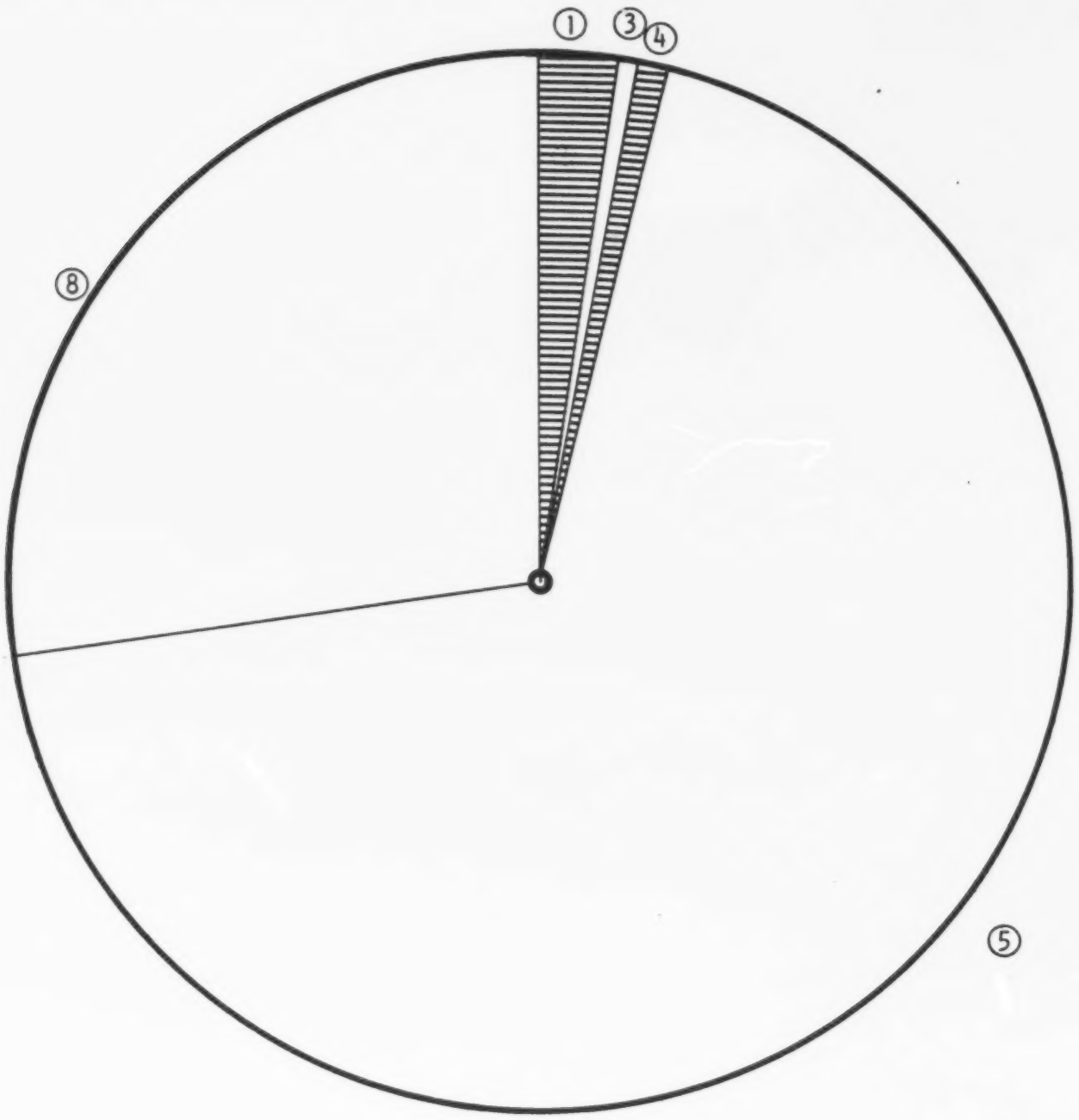
① POWER PLANTS	0%	⑤ INDUSTRIAL	0.4%
② PROCESSES	0%	⑥ INCINERATION	0%
③ RESIDENTIAL	0.1%	⑦ OPEN BURNING	0%
④ COMMERCIAL & INSTITUTIONAL	0.1%	⑧ TRANSPORTATION	99.4%

FIGURE 15. ANNUAL HYDROCARBON EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 008



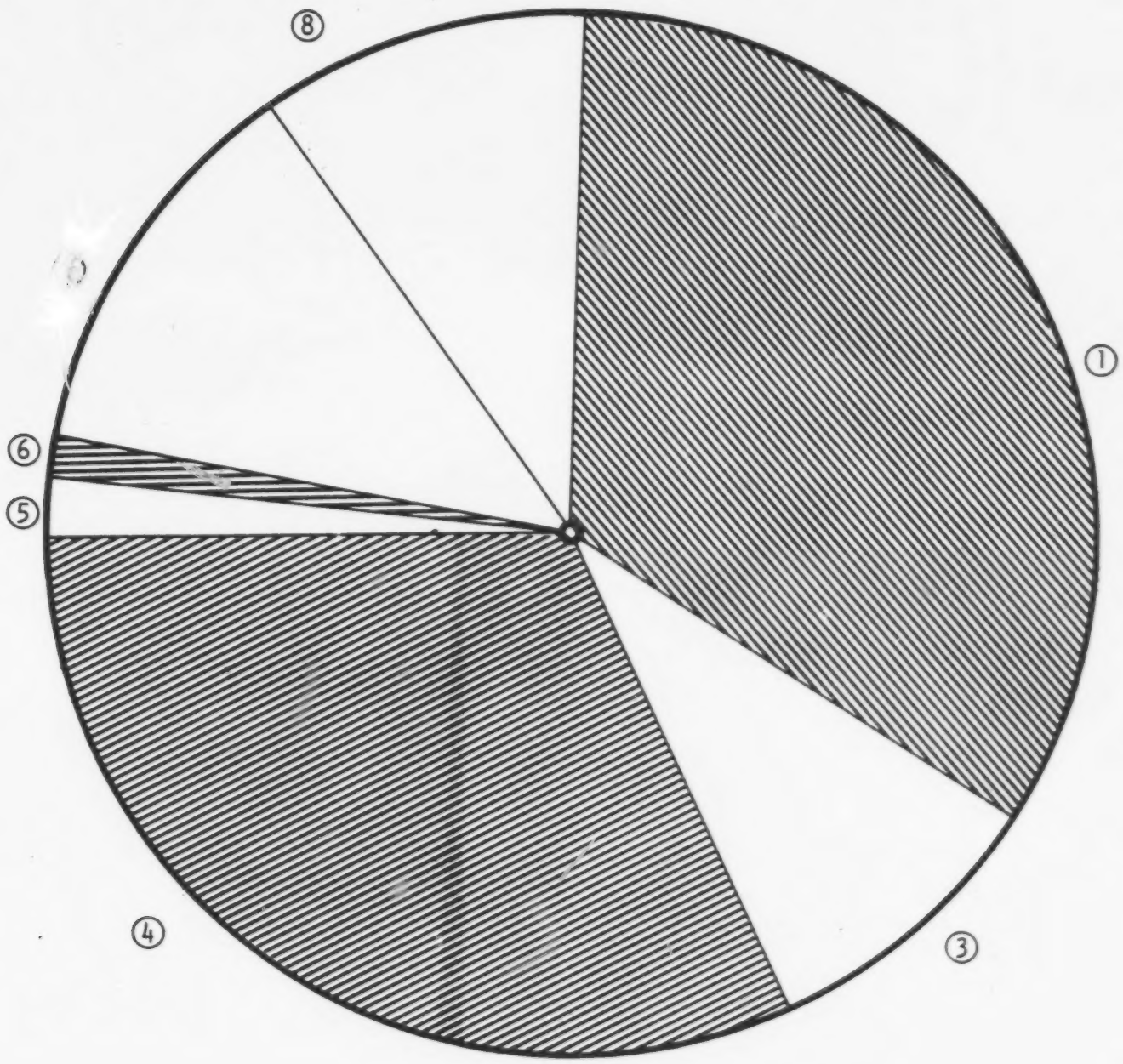
①	POWER PLANTS	0.3%	⑤	INDUSTRIAL	4.4%
②	PROCESSES	54.3%	⑥	INCINERATION	0%
③	RESIDENTIAL	0.1%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	0.1%	⑧	TRANSPORTATION	40.8%

FIGURE 16. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 008



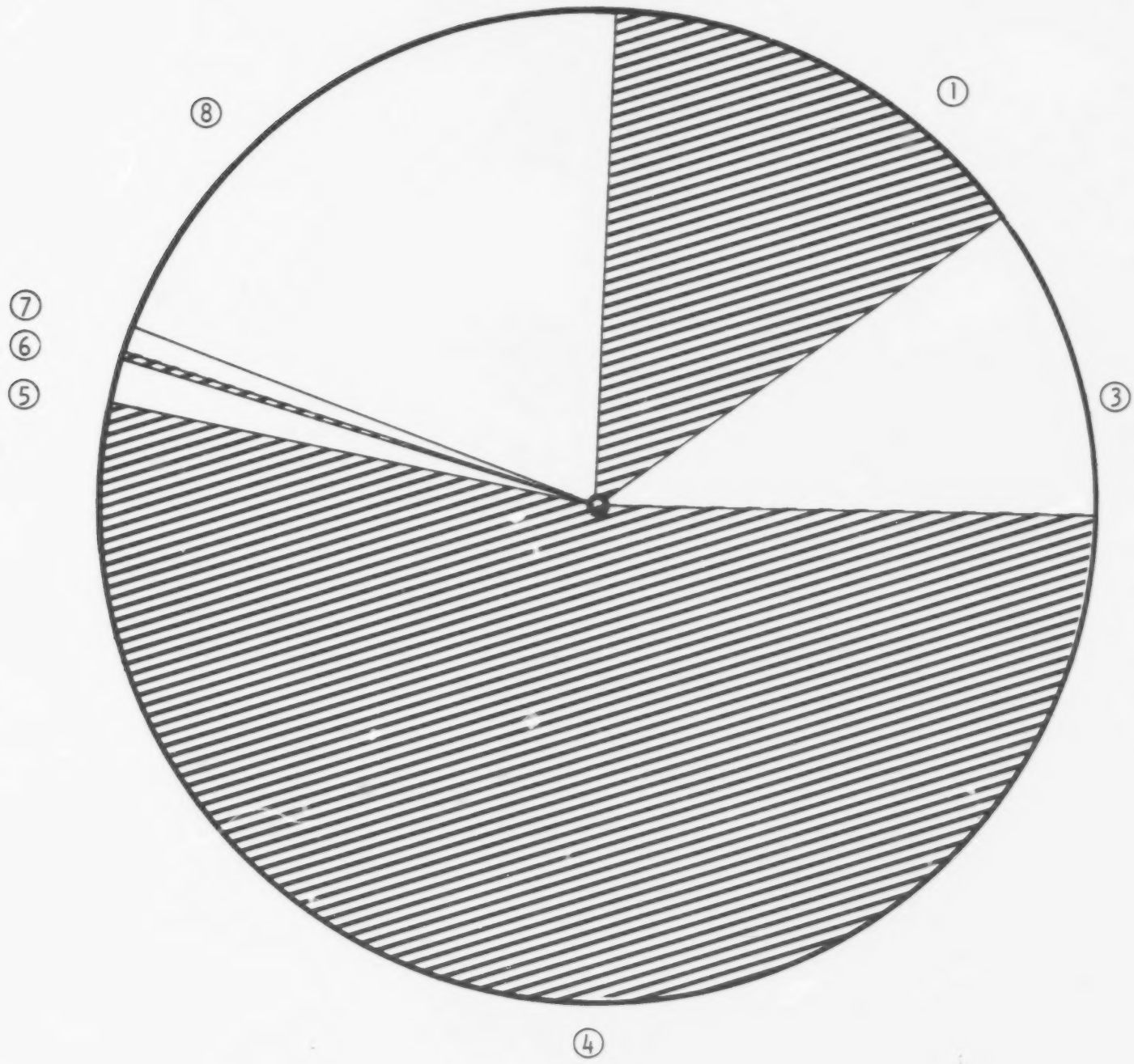
①	POWER PLANTS	2.3%	⑤	INDUSTRIAL	68.9%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	0.6%	⑦	OPEN BURNING	0%
④	COMMERCIAL & INSTITUTIONAL	1.0%	⑧	TRANSPORTATION	27.2%

FIGURE 17. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 009



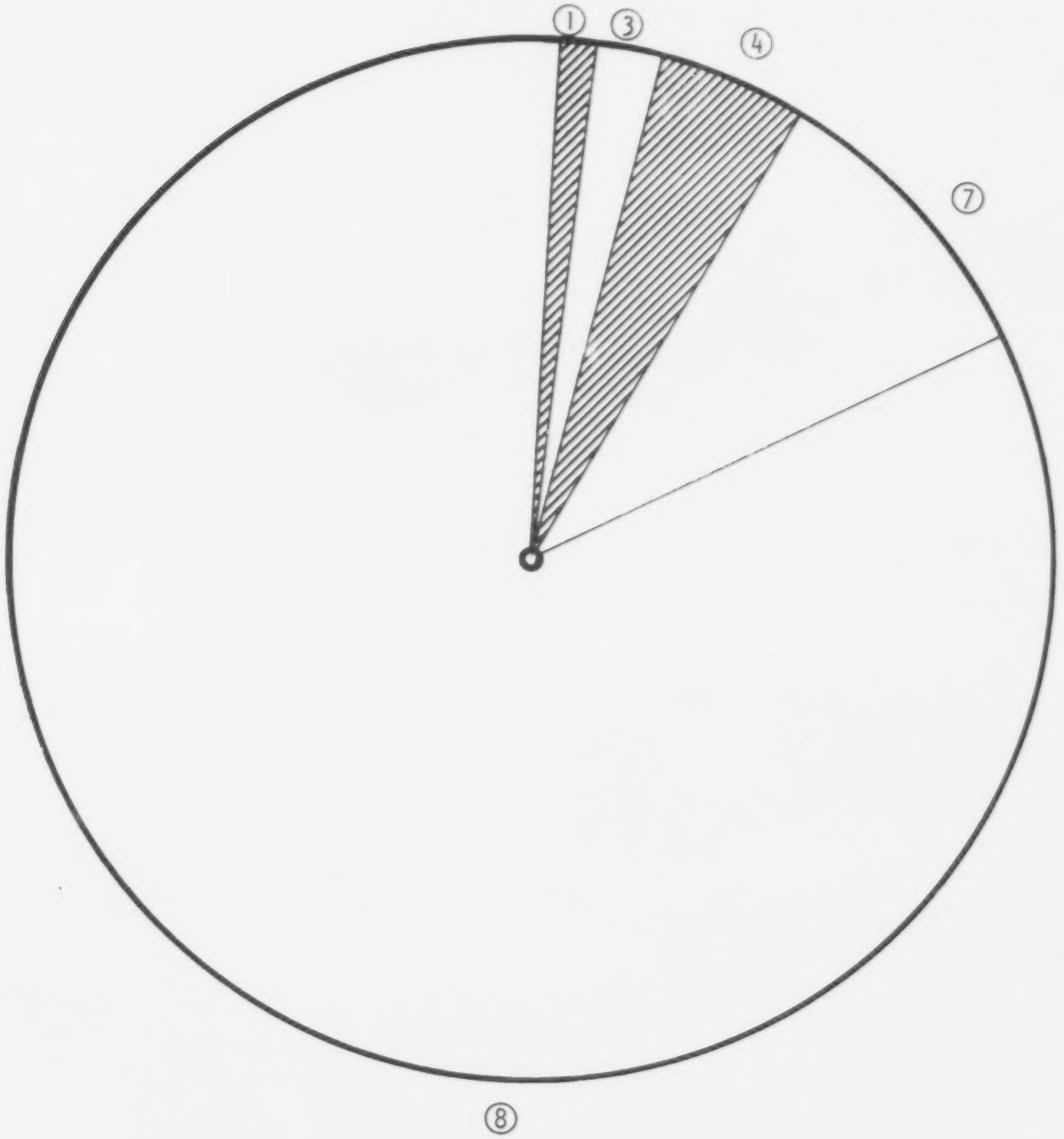
①	POWER PLANTS	33.6%	⑤	INDUSTRIAL	1.8%
②	PROCESSES	0%	⑥	INCINERATION	1.4%
③	RESIDENTIAL	9.2%	⑦	OPEN BURNING	12.2%
④	COMMERCIAL & INSTITUTIONAL	31.6%	⑧	TRANSPORTATION	10.2%

FIGURE 18. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 009



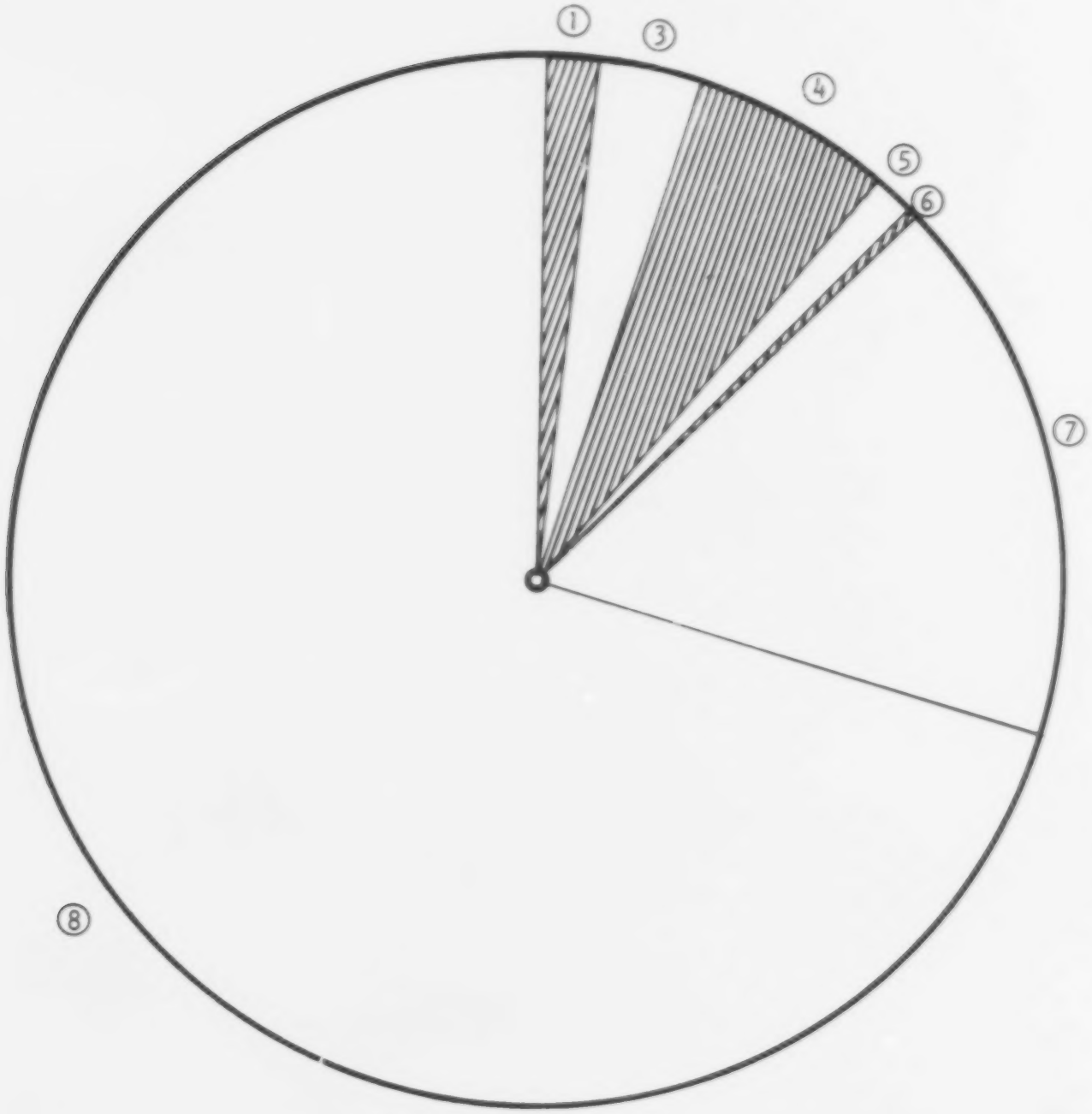
①	POWER PLANTS	14.4%	⑤	INDUSTRIAL	1.3%
②	PROCESSES	0%	⑥	INCINERATION	0.2%
③	RESIDENTIAL	10.2%	⑦	OPEN BURNING	1.0%
④	COMMERCIAL & INSTITUTIONAL	53.3%	⑧	TRANSPORTATION	19.6%

FIGURE 19. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 009



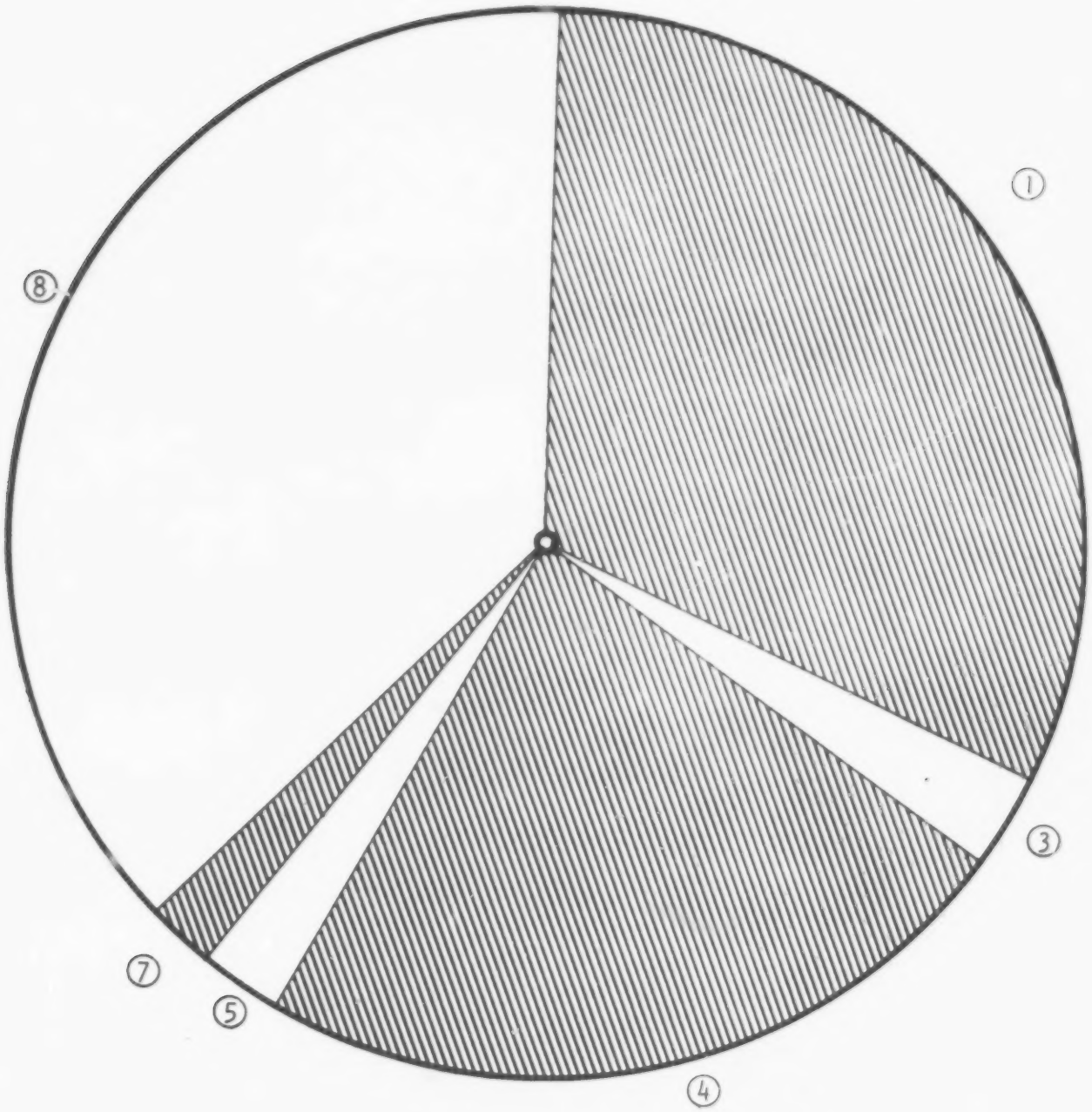
① POWER PLANTS	1.1%	⑤ INDUSTRIAL	0%
② PROCESSES	0%	⑥ INCINERATION	0%
③ RESIDENTIAL	2.1%	⑦ OPEN BURNING	9.3%
④ COMMERCIAL & INSTITUTIONAL	4.5%	⑧ TRANSPORTATION	83.0%

FIGURE 20. ANNUAL HYDROCARBON EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 009



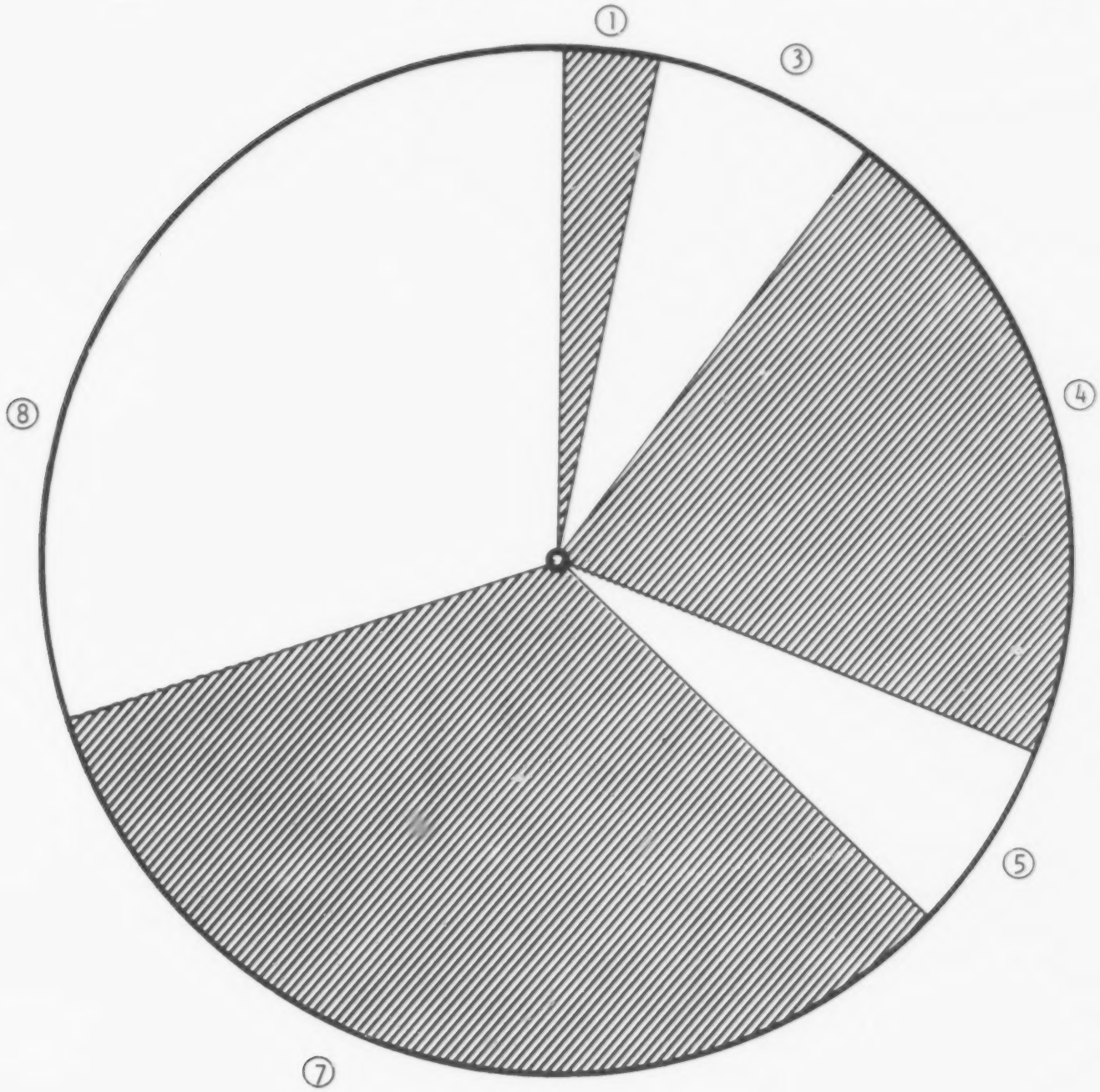
①	POWER PLANTS	1.6%	⑤	INDUSTRIAL	1.4%
②	PROCESSES	0%	⑥	INCINERATION	0.2%
③	RESIDENTIAL	3.1%	⑦	OPEN BURNING	17.0%
④	COMMERCIAL & INSTITUTIONAL	6.1%	⑧	TRANSPORTATION	70.6%

FIGURE 21. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 009



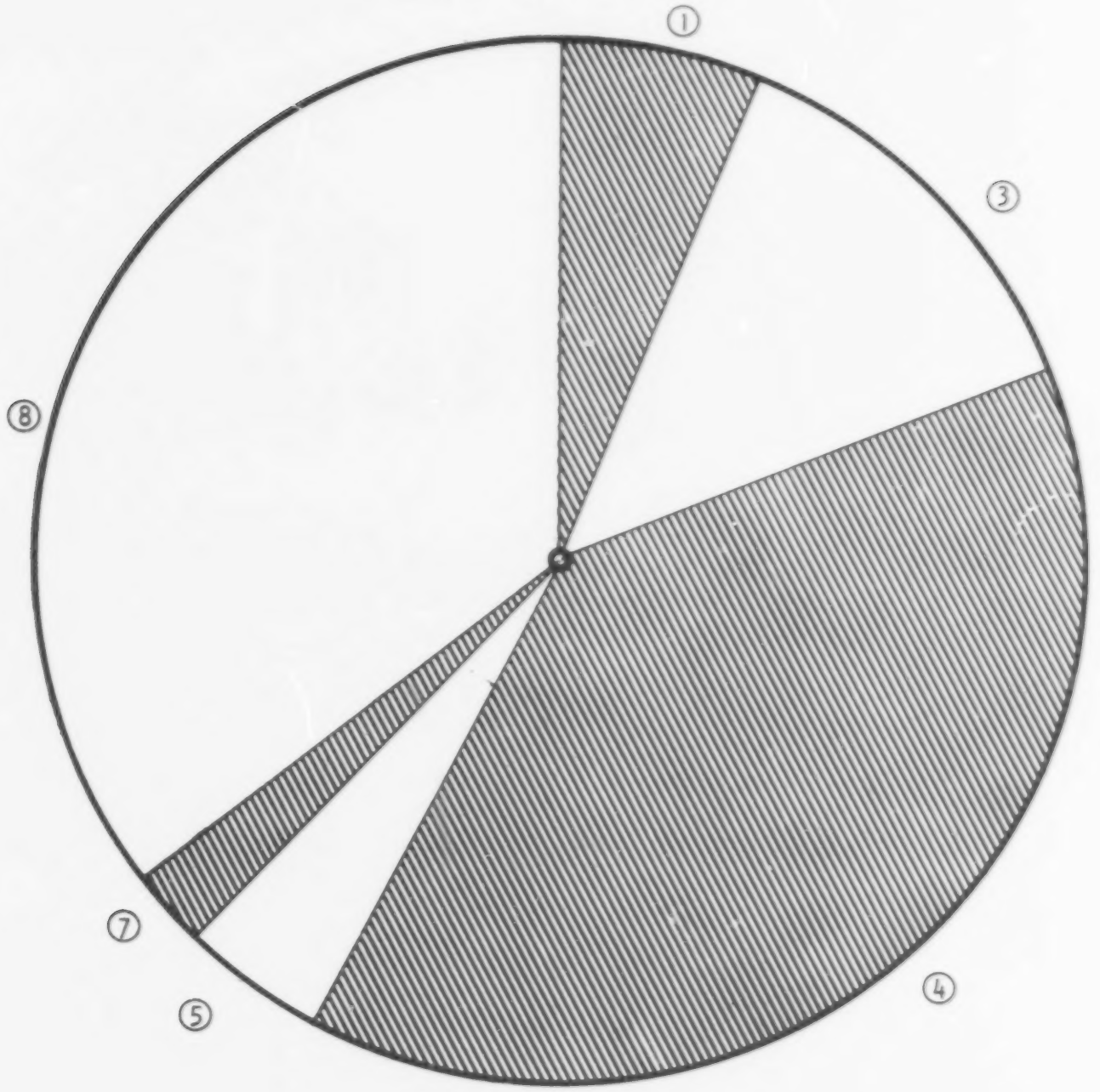
①	POWER PLANTS	31.9%	
②	PROCESSES	0%	
③	RESIDENTIAL	2.8%	
④	COMMERCIAL & INSTITUTIONAL	23.3%	
⑤	INDUSTRIAL	2.5%	
⑥	INCINERATION	0%	
⑦	OPEN BURNING	2.1%	
⑧	TRANSPORTATION	37.4%	

FIGURE 22. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 010



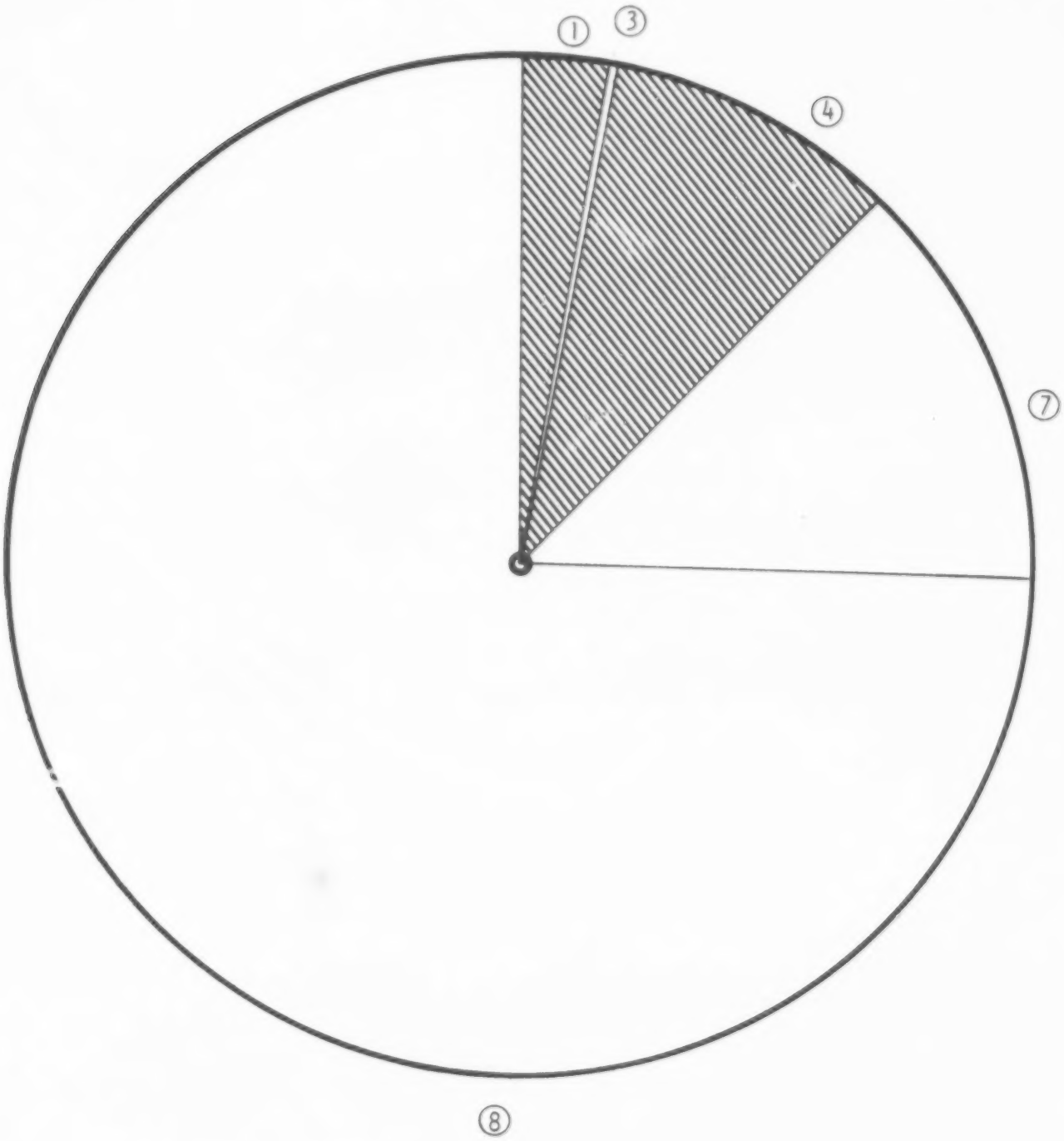
①	POWER PLANTS	2.9%	⑤	INDUSTRIAL	6.1%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	7.0%	⑦	OPEN BURNING	33.0%
④	COMMERCIAL & INSTITUTIONAL	20.9%	⑧	TRANSPORTATION	30.1%

FIGURE 23. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 010



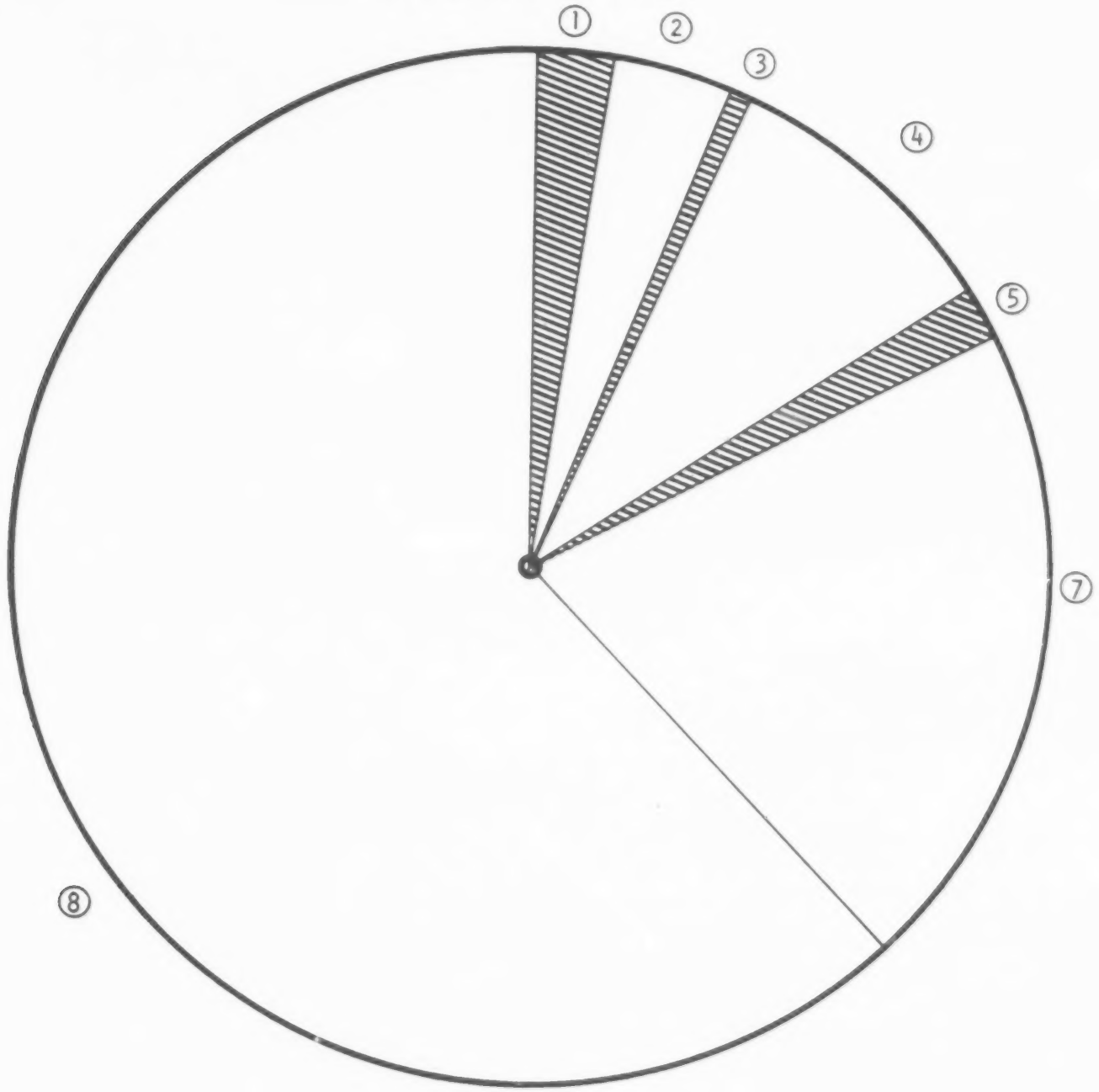
①	POWER PLANTS	6.2%	⑤	INDUSTRIAL	4.5%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	12.8%	⑦	OPEN BURNING	2.4%
④	COMMERCIAL & INSTITUTIONAL	38.8%	⑧	TRANSPORTATION	35.3%

FIGURE 24. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 010



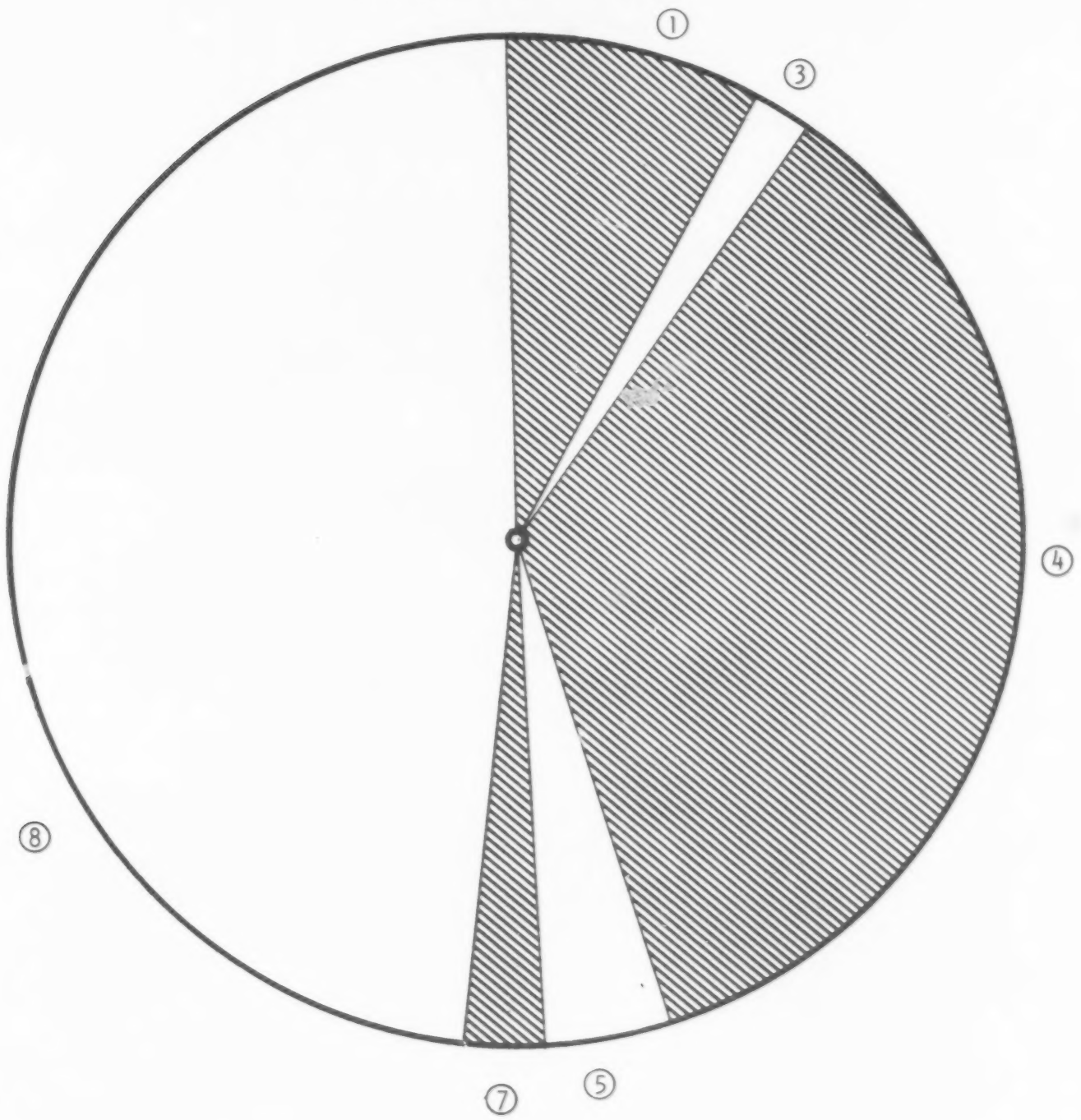
① POWER PLANTS	2.7%	⑤ INDUSTRIAL	0%
② PROCESSES	0%	⑥ INCINERATION	0%
③ RESIDENTIAL	.3%	⑦ OPEN BURNING	13.1%
④ COMMERCIAL & INSTITUTIONAL	9.3%	⑧ TRANSPORTATION	74.6%

FIGURE 25. ANNUAL HYDROCARBON EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 010



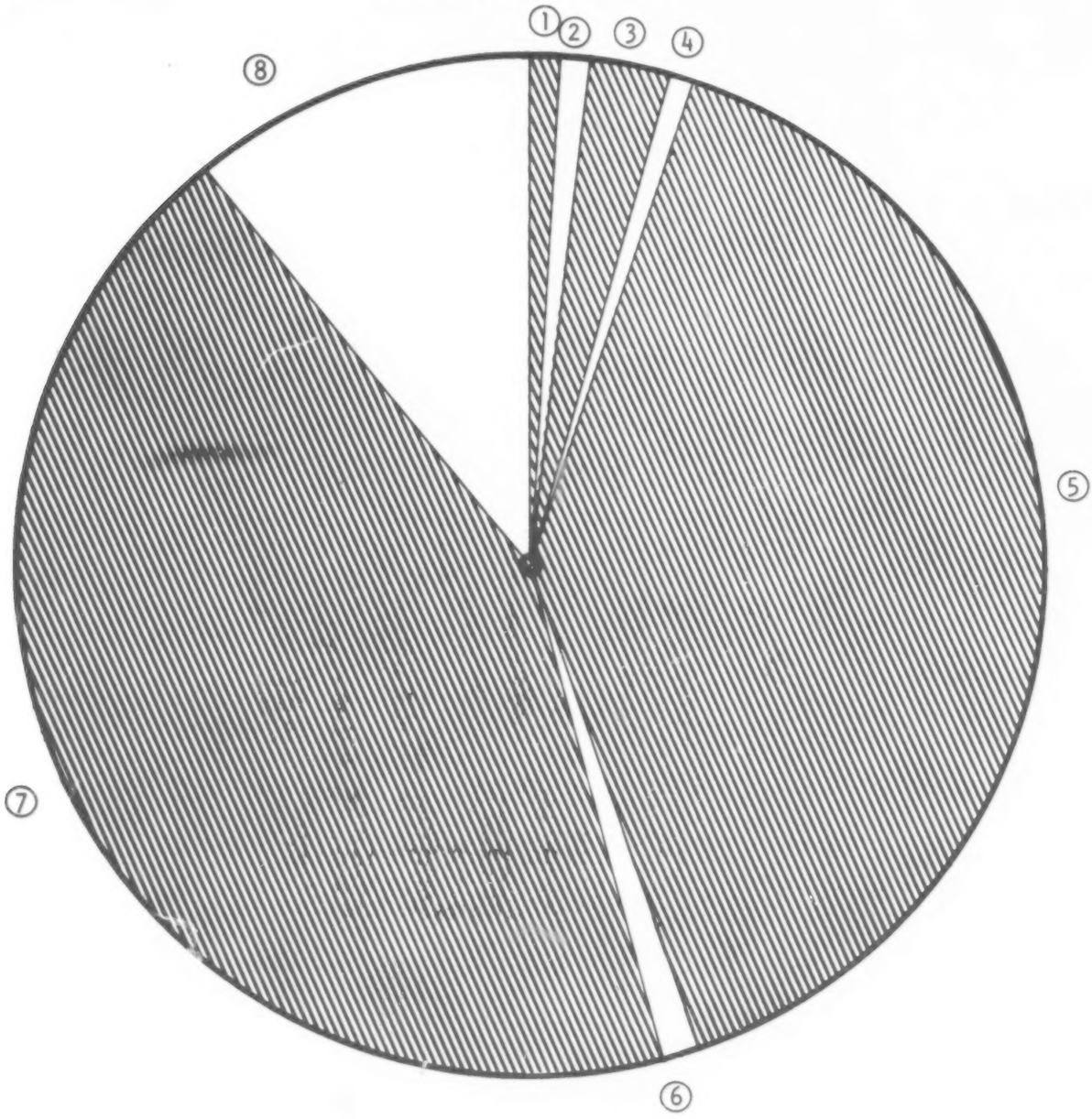
①	POWER PLANTS	2.4%	⑤	INDUSTRIAL	1.6%
②	PROCESSES	3.7%	⑥	INCINERATION	0%
③	RESIDENTIAL	.7%	⑦	OPEN BURNING	20.4%
④	COMMERCIAL & INSTITUTIONAL	9.0%	⑧	TRANSPORTATION	62.2%

FIGURE 26. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 010



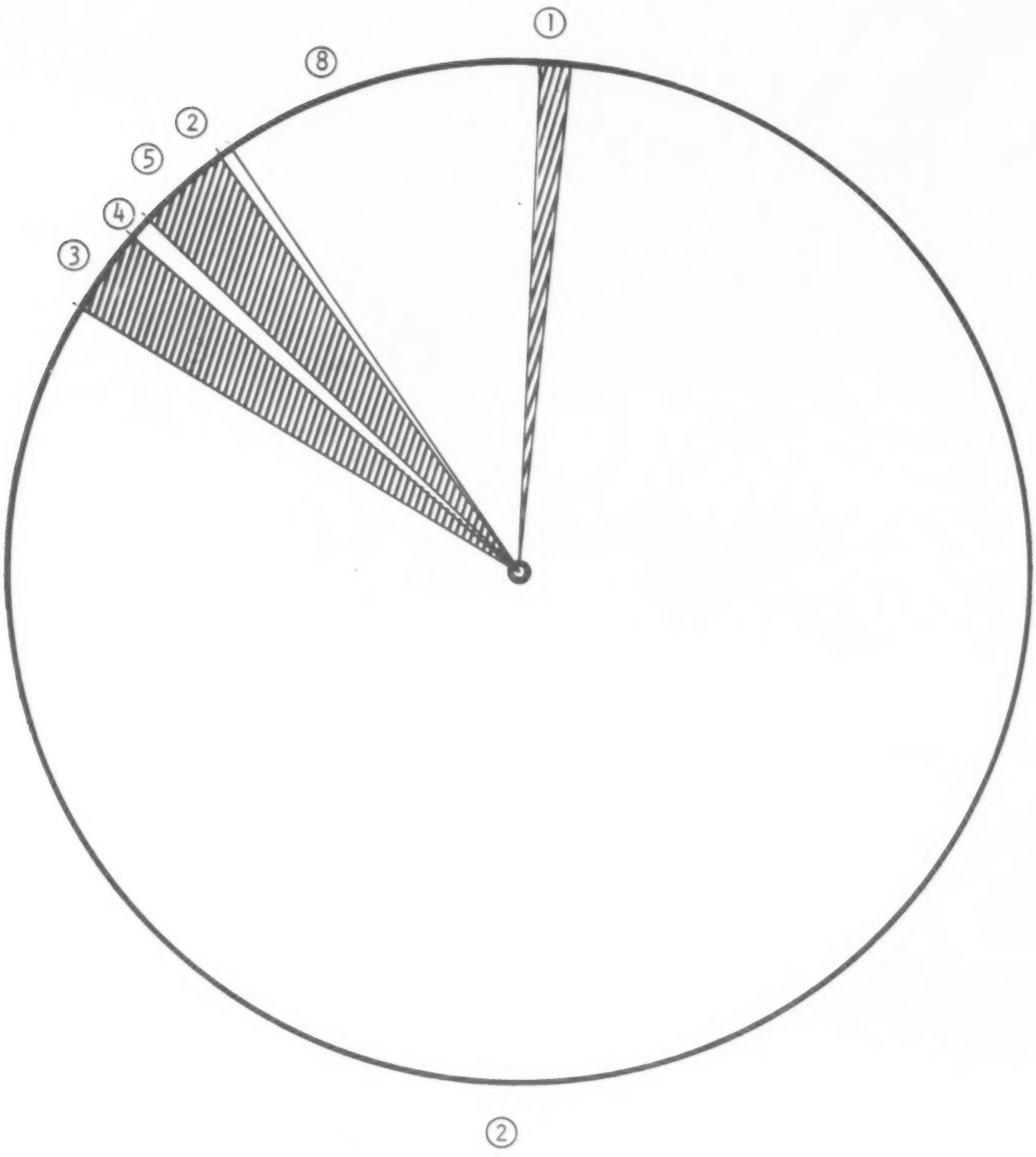
①	POWER PLANTS	8.1%	⑤	INDUSTRIAL	4.0%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	1.9%	⑦	OPEN BURNING	2.6%
④	COMMERCIAL & INSTITUTIONAL	35.4%	⑧	TRANSPORTATION	48.0%

FIGURE 27. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 011



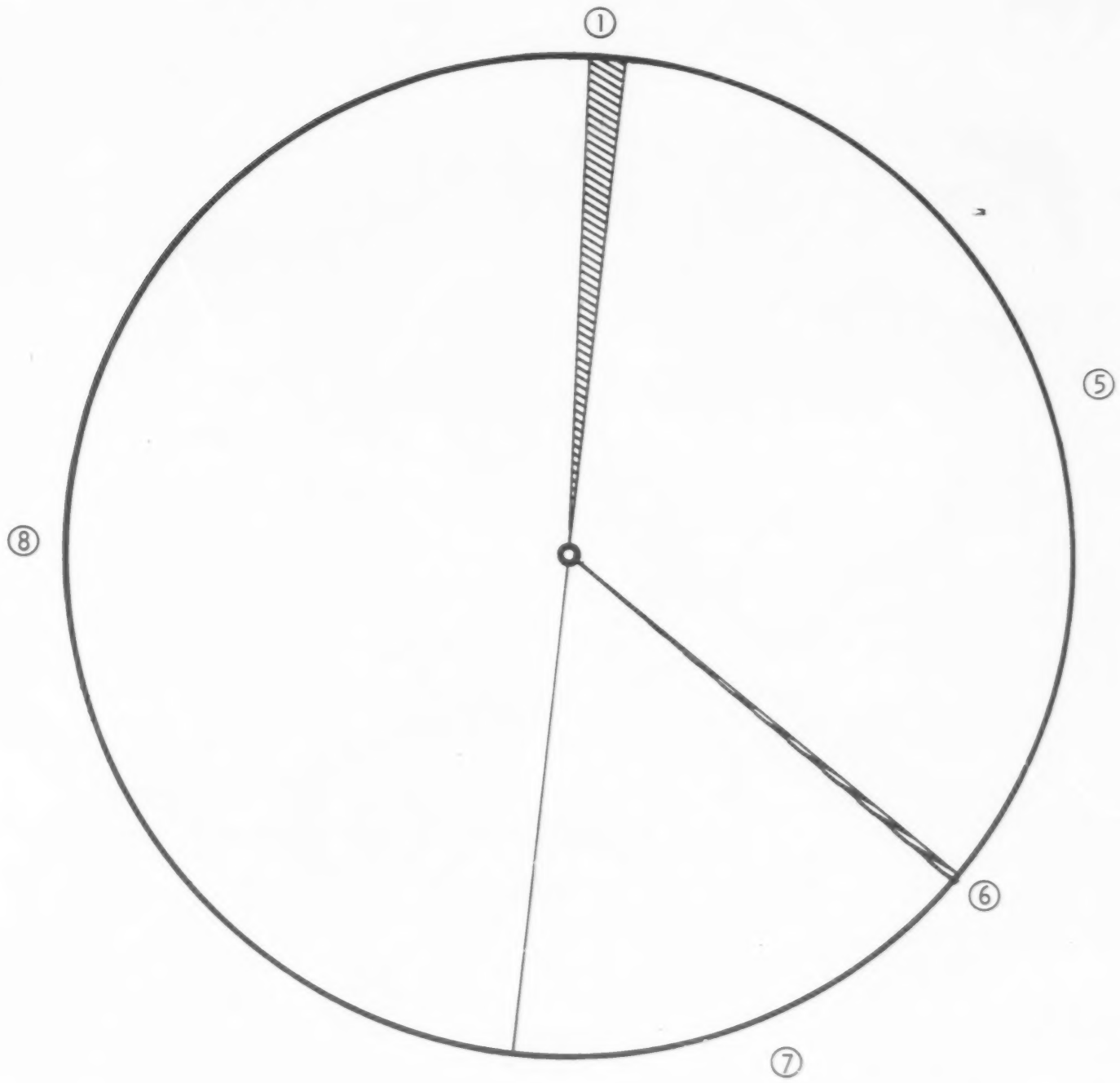
1	POWER PLANTS	.8%	5	INDUSTRIAL	39.6%
2	PROCESSES	1.0%	6	INCINERATION	1.1%
3	RESIDENTIAL	2.6%	7	OPEN BURNING	43.2%
4	COMMERCIAL & INSTITUTIONAL	0.8%	8	TRANSPORTATION	10.9%

FIGURE 28. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 011



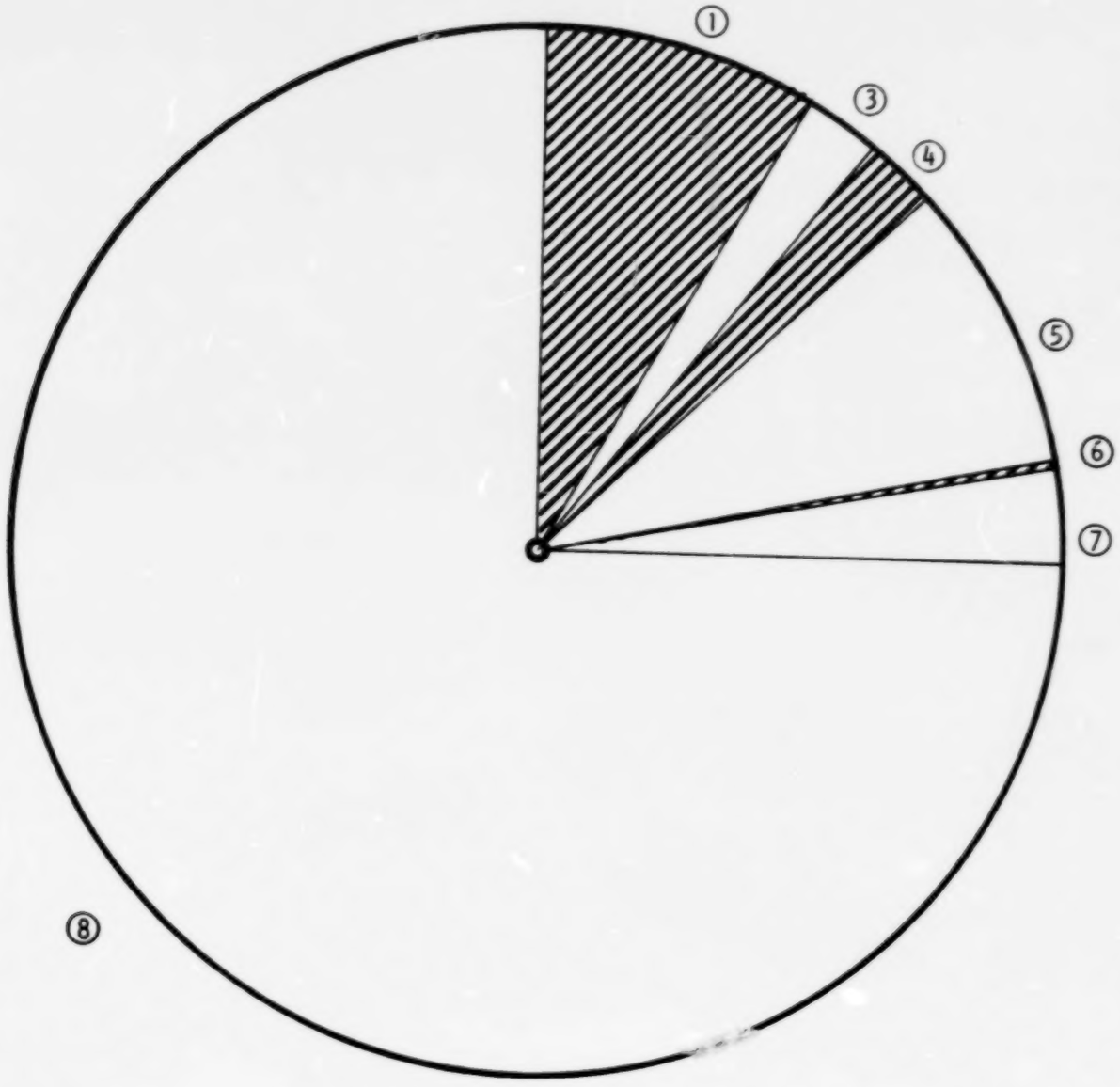
①	POWER PLANTS	1.0%	⑤	INDUSTRIAL	2.9%
②	PROCESSES	82.0%	⑥	INCINERATION	0%
③	RESIDENTIAL	2.7%	⑦	OPEN BURNING	0.4%
④	COMMERCIAL & INSTITUTIONAL	0.8%	⑧	TRANSPORTATION	10.2%

FIGURE 29. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 011



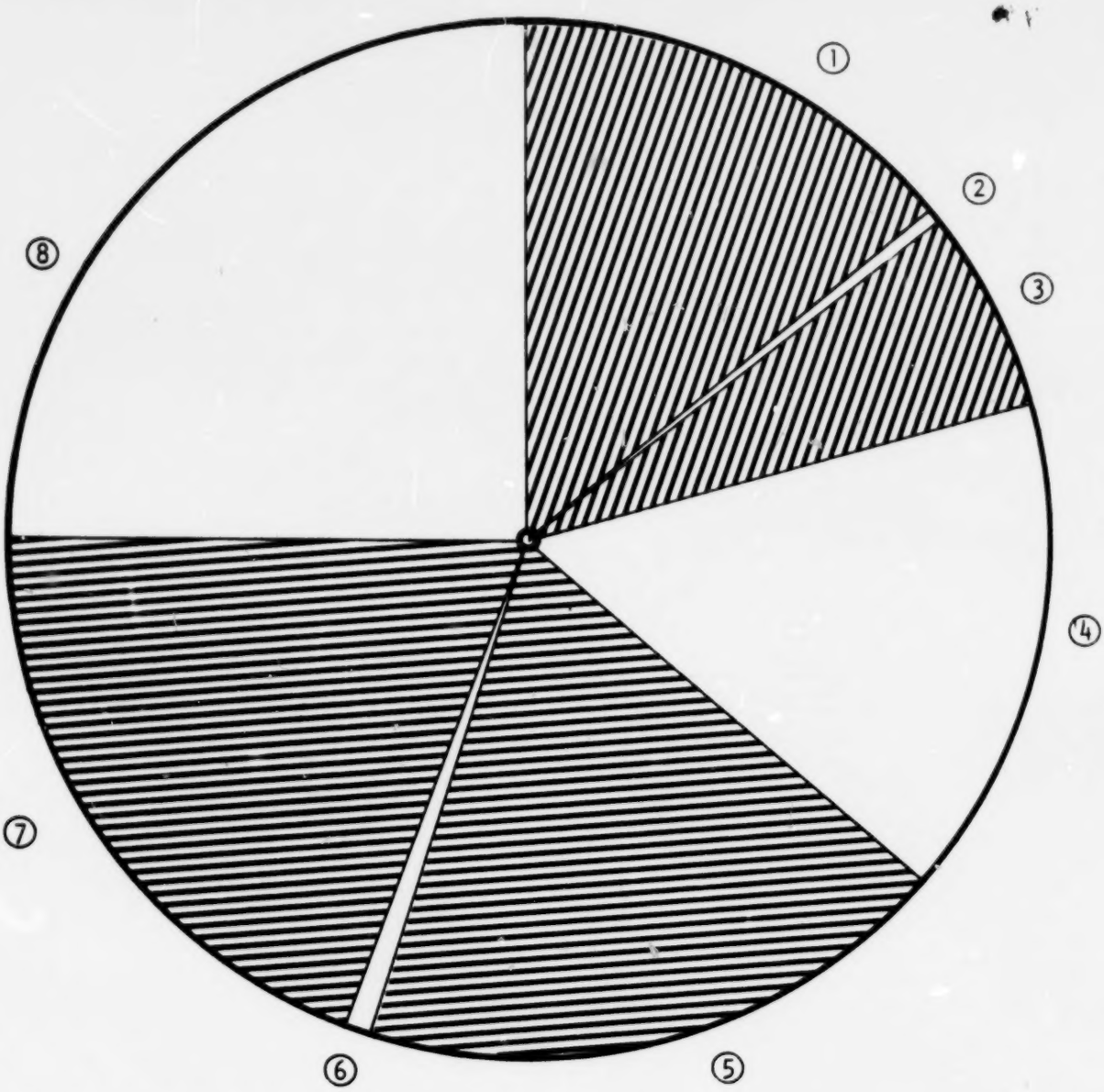
①	POWER PLANTS	1.2%	⑤	INDUSTRIAL	34.0%
②	PROCESSES	0%	⑥	INCINERATION	0.2%
③	RESIDENTIAL	0%	⑦	OPEN BURNING	15.8%
④	COMMERCIAL & INSTITUTIONAL	0%	⑧	TRANSPORTATION	48.8%

FIGURE 31. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
AIR QUALITY REGION 011



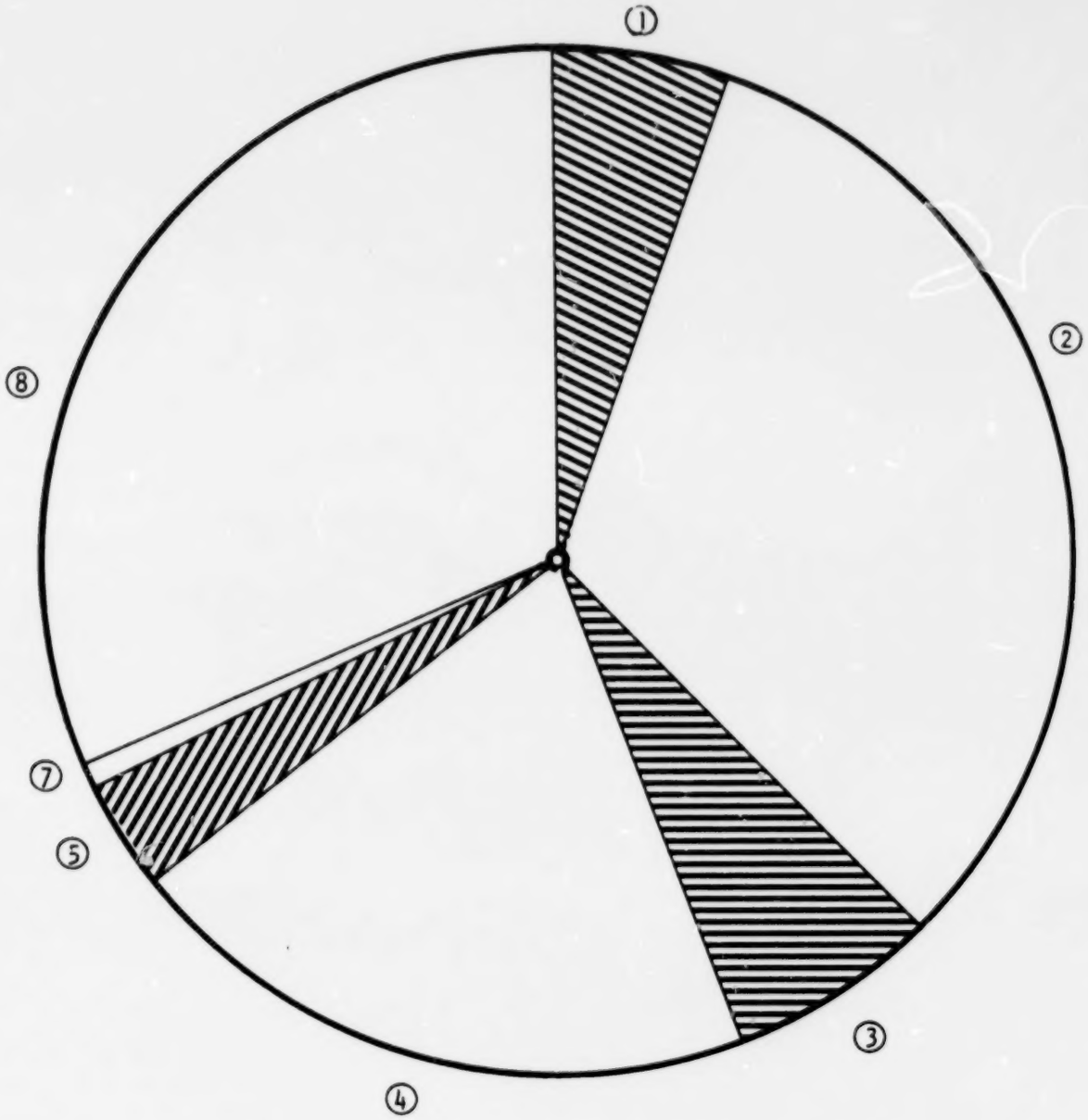
①	POWER PLANTS	8.4%	⑤	INDUSTRIAL	8.9%
②	PROCESSES	0%	⑥	INCINERATION	0.2%
③	RESIDENTIAL	2.3%	⑦	OPEN BURNING	3.0%
④	COMMERCIAL & INSTITUTIONAL	2.3%	⑧	TRANSPORTATION	74.9%

FIGURE 32. ANNUAL PARTICULATE EMISSIONS BY SOURCE CATEGORY
STATE WIDE



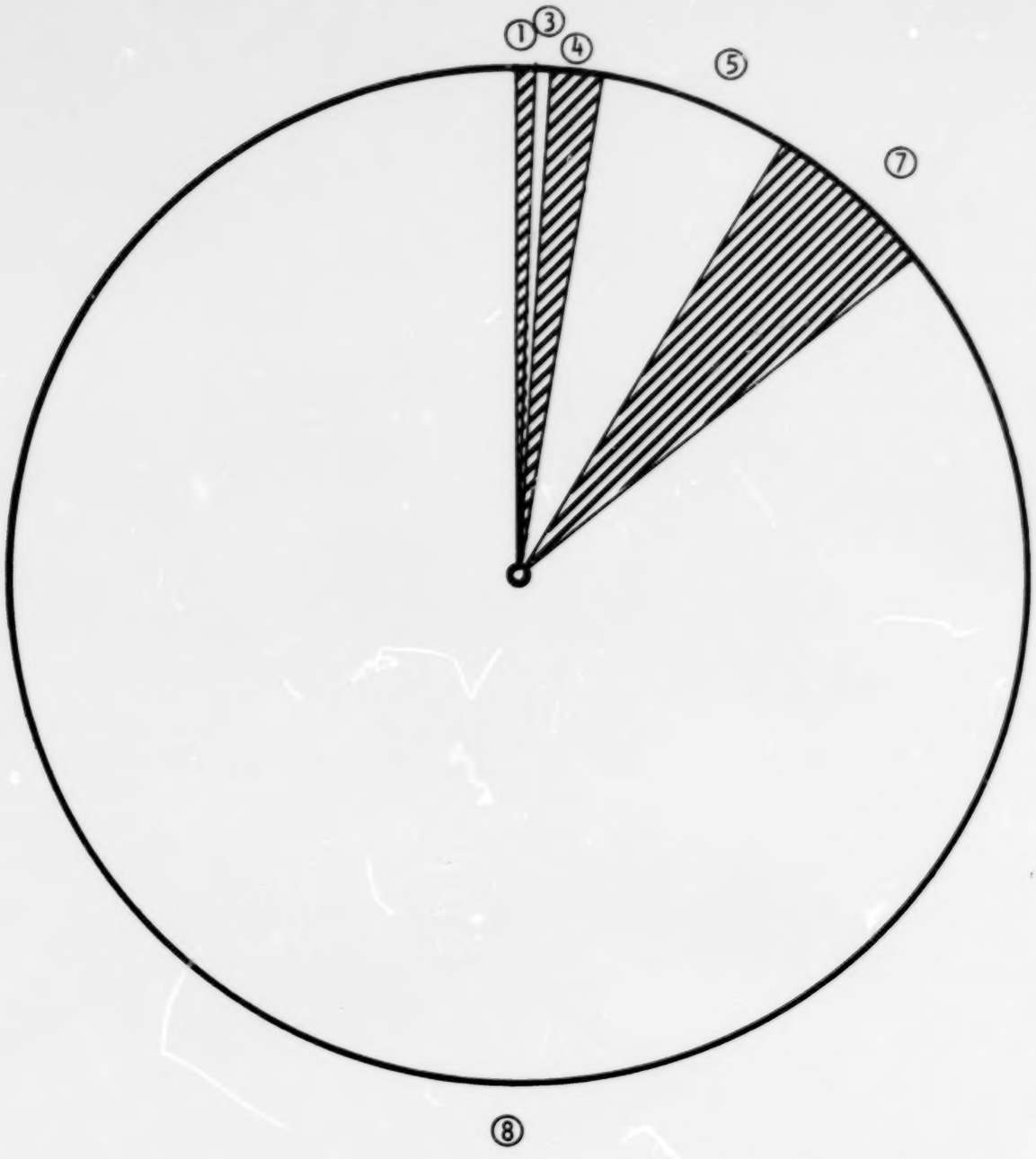
①	POWER PLANTS	14.1%	⑤	INDUSTRIAL	18.6%
②	PROCESSES	0.4%	⑥	INCINERATION	0.8%
③	RESIDENTIAL	6.4%	⑦	OPEN BURNING	19.4%
④	COMMERCIAL & INSTITUTIONAL	15.5%	⑧	TRANSPORTATION	24.8%

FIGURE 33. ANNUAL SOX EMISSIONS BY SOURCE CATEGORY
STATE WIDE



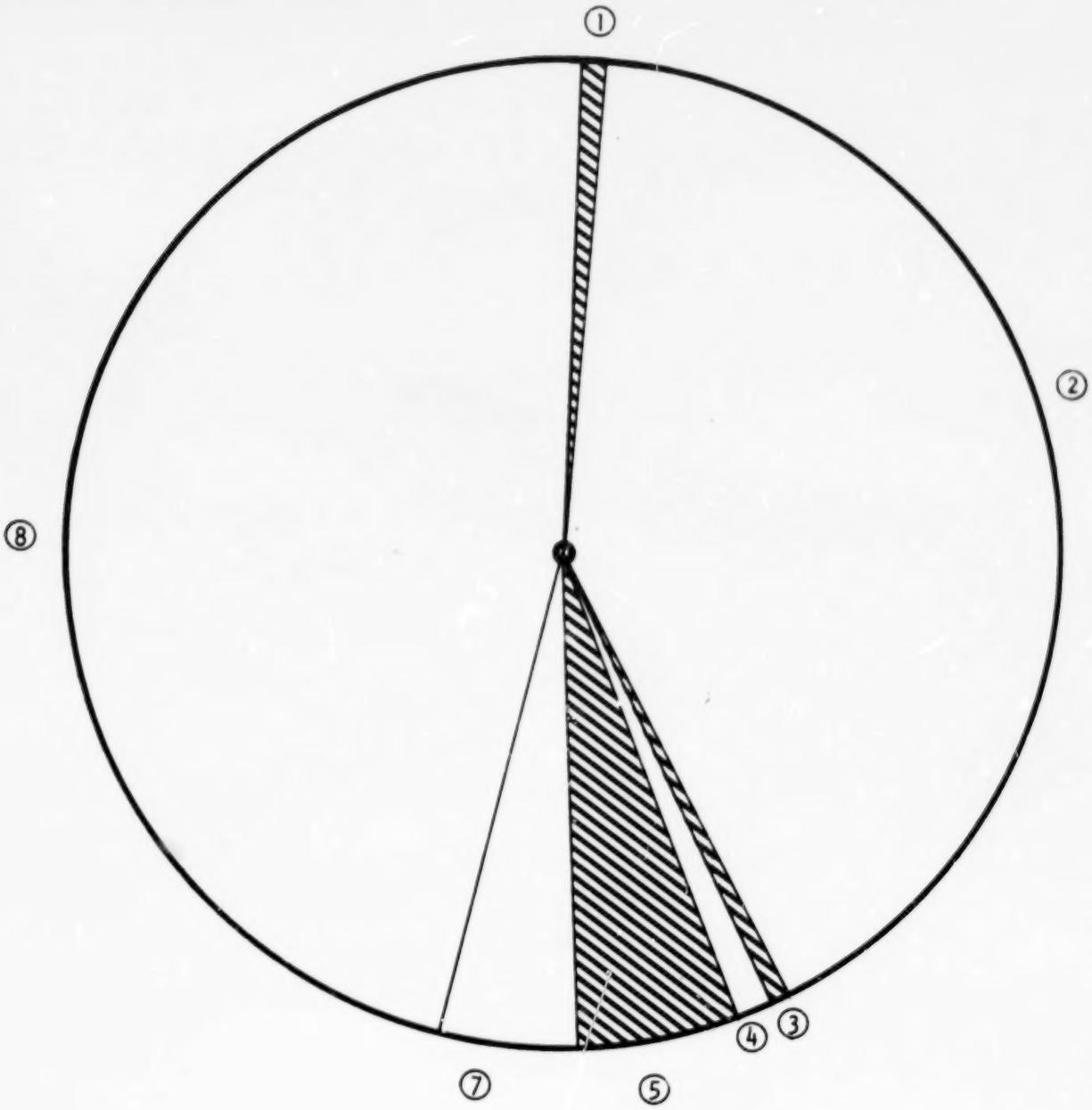
①	POWER PLANTS	5.4%	⑤	INDUSTRIAL	3.4%
②	PROCESSES	32.2%	⑥	INCINERATION	0.1%
③	RESIDENTIAL	6.6%	⑦	OPEN BURNING	0.6%
④	COMMERCIAL & INSTITUTIONAL	20.2%	⑧	TRANSPORTATION	31.5%

FIGURE 34. ANNUAL CARBON MONOXIDE EMISSIONS BY SOURCE CATEGORY
STATE WIDE



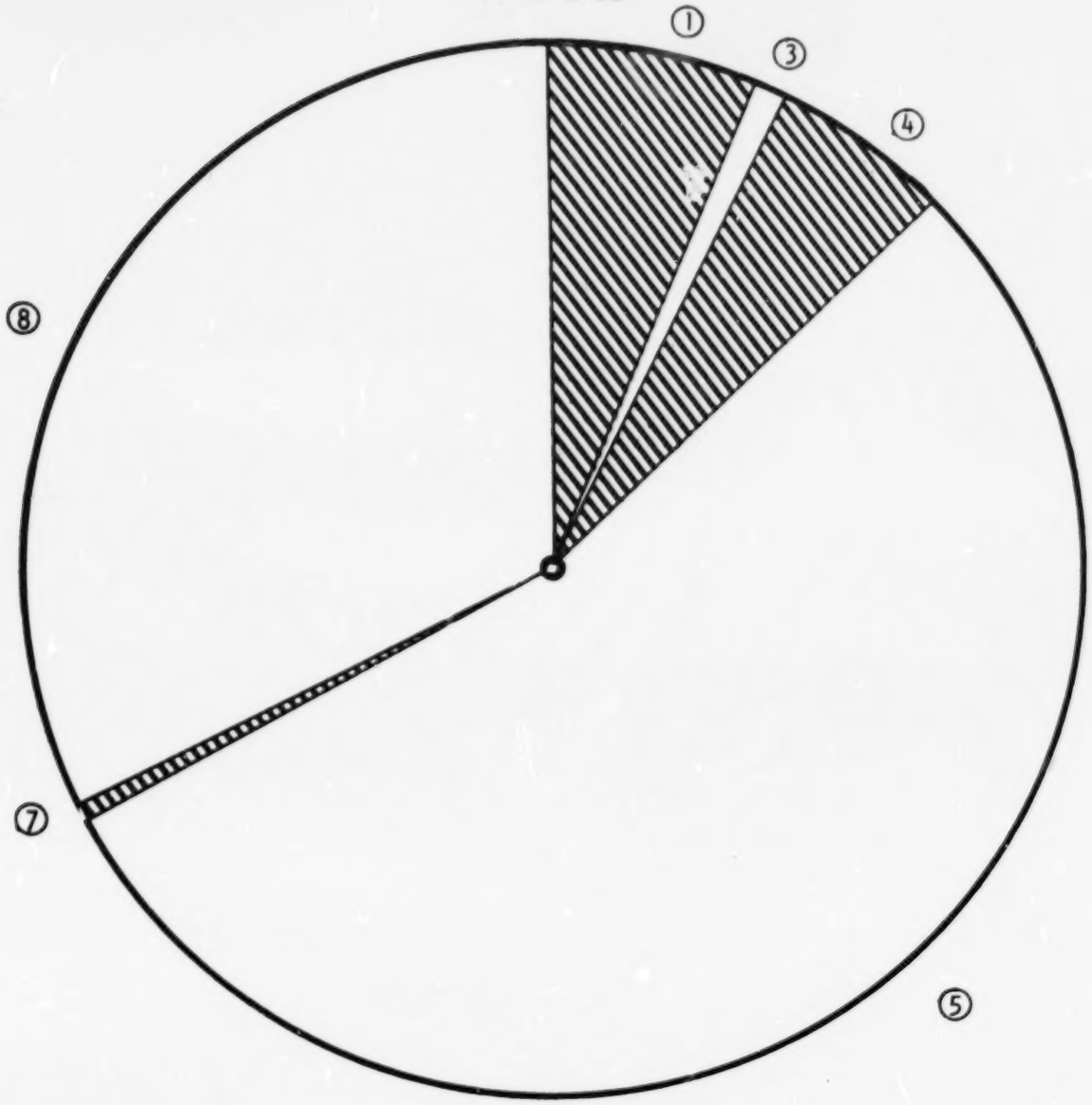
①	POWER PLANTS	0.6%	⑤	INDUSTRIAL	6.2%
②	PROCESSES	0%	⑥	INCINERATION	0.1%
③	RESIDENTIAL	0.5%	⑦	OPEN BURNING	5.4%
④	COMMERCIAL & INSTITUTIONAL	1.6%	⑧	TRANSPORTATION	85.6%

FIGURE 35. ANNUAL HYDROCARBON EMISSIONS BY SOURCE CATEGORY
STATE WIDE



① POWER PLANTS	0.7%	⑤ INDUSTRIAL	5.3%
② PROCESSES	41.2%	⑥ INCINERATION	0.1%
③ RESIDENTIAL	0.5%	⑦ OPEN BURNING	4.6%
④ COMMERCIAL & INSTITUTIONAL	1.3%	⑧ TRANSPORTATION	46.3%

FIGURE 36. ANNUAL NOX EMISSIONS BY SOURCE CATEGORY
STATE WIDE



①	POWER PLANTS	6.4%	⑤	INDUSTRIAL	54.3%
②	PROCESSES	0%	⑥	INCINERATION	0%
③	RESIDENTIAL	1.0%	⑦	OPEN BURNING	0.6%
④	COMMERCIAL & INSTITUTIONAL	5.6%	⑧	TRANSPORTATION	32.1%

TABLE 13. SUMMARY OF ANNUAL FUEL USE OF ALL STATIONARY SOURCES

AIR QUALITY REGION	RESIDENTIAL			COMMERCIAL/INSTITUTIONAL				INDUSTRIAL			
	COAL TONS/YR	FUEL OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR	COAL TONS/YR	RESIDUAL OIL 10^3 GAL/YR	DISTILLATE OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR	COAL TONS/YR	RESIDUAL OIL 10^3 GAL/YR	DISTILLATE OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR
ANCHORAGE	NONE	23,089	5,450	NONE	508	6,576	9,599	NONE	15,316	6,920	10,382
FAIRBANKS	27,000	30,688	NONE	352,891	149	5,925	NONE	201,690	4,327	3,577	NONE
008	NEGLIGIBLE	29,400	6,940	NEGLIGIBLE	610	8,828	11,400	NEGLIGIBLE	28,031	8,202	78,990*
009	27,000	39,200	630	435,260	170	11,473	NEGLIGIBLE	201,690	6,300	5,360	NONE
010	NONE	16,200	390	NONE	6,982	20,260	NEGLIGIBLE	NONE	3,570	6,922	NONE
011	NONE	20,500	NEGLIGIBLE	NONE	270	3,950	NEGLIGIBLE	NONE	7,930	6,647	NONE
STATE TOTAL	27,000	105,300	7,960	435,260	8,032	44,511	11,400	201,690	45,831	27,131	78,990

* INCLUDES 33,709 MMCF OF FLARING

TABLE 14. SUMMARY OF ANNUAL FUEL USE OF RESIDENTIAL, COMMERCIAL/INSTITUTIONAL AND INDUSTRIAL AREA SOURCES

AIR QUALITY REGION	RESIDENTIAL			COMMERCIAL/INSTITUTIONAL				INDUSTRIAL			
	COAL TONS/YR	FUEL OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR	COAL TONS/YR	RESIDUAL OIL 10^3 GAL/YR	DISTILLATE OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR	COAL TONS/YR	RESIDUAL OIL 10^3 GAL/YR	DISTILLATE OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR
ANCHORAGE	NONE	23,089	5,450	NONE	508	6,349	8,417	NONE	14,614	5,769	NEGLIGIBLE
FAIRBANKS	27,000	10,688	NONE	33,300	149	2,125	NONE	NEGLIGIBLE	4,327	2,322	NONE
008	NEGLIGIBLE	29,400	6,940	NEGLIGIBLE	610	7,618	10,100	NEGLIGIBLE	19,000	7,500	NEGLIGIBLE
009	27,000	39,200	630	33,300	170	2,430	NEGLIGIBLE	NEGLIGIBLE	6,300	3,380	NEGLIGIBLE
010	NONE	16,200	390	NONE	200	2,870	NEGLIGIBLE	NONE	3,570	3,150	NEGLIGIBLE
011	NONE	20,500	NEGLIGIBLE	NONE	270	3,950	NEGLIGIBLE	NONE	7,930	3,680	NEGLIGIBLE
STATE TOTAL	27,000	105,300	7,960	33,300	1,250	16,868	10,100	NEGLIGIBLE	36,800	17,910	NEGLIGIBLE

TABLE 15. SUMMARY OF ANNUAL FUEL USE OF ALL POINT SOURCES

AIR QUALITY REGION	RESIDENTIAL			COMMERCIAL/INSTITUTIONAL				INDUSTRIAL			
	COAL TONS/YR	FUEL OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR	COAL TONS/YR	RESIDUAL OIL 10^3 GAL/YR	DISTILLATE OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR	COAL TONS/YR	RESIDUAL OIL 10^3 GAL/YR	DISTILLATE OIL 10^3 GAL/YR	NATURAL GAS 10^6 FT^3/YR
ANCHORAGE	NONE			NONE	NONE	227	1182	NONE	702	1151	10,382
FAIRBANKS				319,591	NONE	3,800	NONE	201,690	NONE	1,255	NONE
008				NONE	NONE	1,210	1,300	NONE	9,031	702	78,990
009				401,960	NONE	9,043	NONE	201,690	NONE	1,980	NONE
010				NONE	6,782	17,390	NONE	NONE	NONE	3,772	NONE
011				NONE	NONE	NONE	NONE	NONE	NONE	2,767	NONE
STATE TOTAL				401,960	6,782	27,643	1,300	201,690	9,031	9,221	78,990

TABLE 16. ANNUAL VEHICLE MILES BY AUTOMOTIVE AND DIESEL TRAFFIC

	AIR QUALITY REGION 008				AIR QUALITY REGION 009		AIR QUALITY REGION 010						AIR QUALITY REGION 011					STATE TOTAL
	ANCHORAGE	KENAI	SEWARD	MATANUSKA	FAIRBANKS	NOME	ALEUTIANS	BETHEL	BRISTOL	CORDOVA	KODIAK	VALDEZ	HAYNES SKAGWAY	KETCHIKAN	JUNEAU	SITKA	PETERSBURG WRANGELL	
GASOLINE POWER'D VEHICLES, X 1000 MILES	574,016	36,407	5,345	20,132	150,473	3,527	700	1,547	2,968	4,530	20,254	10,900	5,962	24,331	31,563	8,679	6,655	906,000
	635,900				154,000		40,900						77,200					
DIESEL POWERED VEHICLES, 10^3 GAL. CONSUMED	68,288	6,712	171	3,399	13,862	278	0	70	1,468	163	4,521	2,167	1,448	2,952	3,370	1,226	6,573	116,670
	78,570				14,140		8,390						15,570					

TABLE 17. REFUSE DISPOSAL BALANCE

AIR QUALITY REGION	SOURCE	INCINERATION TONS	OPEN BURNING TONS	LAND/OCEAN DISP. TONS	TOTAL
ANCHORAGE	RESIDENTIAL	NEGLIGIBLE	NONE	186,976	186,976
	COML/INDUSTRIAL	NEGLIGIBLE	NONE	152,980	152,980
FAIRBANKS	RESIDENTIAL	3,600	36,985	40,585	81,170
	COML/INDUSTRIAL	2,945	30,260	33,205	66,410
008	RESIDENTIAL	NEGLIGIBLE	NEGLIGIBLE	222,591	222,591
	COML/INDUSTRIAL	NEGLIGIBLE	NEGLIGIBLE	182,120	182,120
009	RESIDENTIAL	4,615	47,417	52,030	104,062
	COML/INDUSTRIAL	3,776	38,795	42,570	85,141
010	RESIDENTIAL	NEGLIGIBLE	27,807	27,807	55,614
	COML/INDUSTRIAL	NEGLIGIBLE	22,751	22,751	45,502
011	RESIDENTIAL	3,072	27,650	82,043	112,765
	COML/INDUSTRIAL	4,913	425,485 *	26,217	456,615
STATE WIDE	RESIDENTIAL	7,687	102,874	384,471	495,032
	COML/INDUSTRIAL	8,689	487,031	273,658	769,378

* INCLUDES WOOD WASTE BURNED AS FUEL

TABLE 18. ANNUAL AIRCRAFT LANDINGS AND TAKEOFFS (LTOs) AT AIRFIELDS

AIR QUALITY REGION	AIRPORT	JET AIRCRAFT		PISTON AIRCRAFT	
		SINGLE ENGINE	MULTI ENGINE	SINGLE ENGINE	MULTI ENGINE
008	ANCHORAGE INTERNATIONAL		64,800	37,000	18,000
008	ANCHORAGE L. HOOD			42,800	
008	ANCHORAGE MERRILL			212,000	12,000
008	ELMENDORF A/F BASE		59,495		
008	MISC LIGHT AIRCRAFT			321,780	
009	FAIRBANKS		9, 324	25,700	
009	EIELSON A/F BASE	1,462	3,956	2,150	1,032
009	MISC LIGHT AIRCRAFT			465,300	
010	KING SALMON		5,622	1,600	11,320
010	MISC LIGHT AIRCRAFT			67,800	
011	ANNETTE	1,200	900	4,850	6,050
011	JUNEAU		3,204	8,832	
011	MISC LIGHT AIRCRAFT			164,700	

TABLE 19 SUMMARY OF ANNUAL FUEL USE
RAILROADS AND VESSELS

AIR QUALITY REGION	RAILROADS	VESSELS	
	DIESEL OIL 10^3 GAL/YR	DIESEL OIL 10^3 GAL/YR	GASOLINE 10^3 GAL/YR
ANCHORAGE	967	1,474	510
FAIRBANKS	1,410	NONE	NONE
008	1,410	1,620	560
009	1,410	220	360
010	NONE	10,260	3,550
011	270	6,290	2,110
STATE TOTAL	3,090	18,390	6,580

TABLE 20. FUEL PARAMETERS

	COAL	RESIDUAL OIL	DISTILLATE OIL	DIESEL FUEL	NATURAL GAS
HEAT CONTENT	17.4-23.6x10^6 $\frac{BTU}{TON}$	145,000 $\frac{BTU}{GAL}$	137-139x10^3 $\frac{BTU}{GAL}$	133-135x10^3 $\frac{BTU}{GAL}$	1050 BTU/CF
SULFUR CONTENT	.15-1.00%	.01-.75%	.02-.5%	.02-.08%	NEGLIGIBLE
ASH CONTENT	10.0-12.5%				

TABLE 21 SUMMARY OF AREA SOURCE CALCULATION METHODOLOGY

AREA SOURCE CATEGORY	SOURCE TYPE	BASIS FOR CALCULATION	METHOD OF APPORTIONMENT	APPORTIONMENT DATA SOURCE	REMARKS
Residential Heating	Boiler/Furnace	Coal - Reference 2 Oil - Reference 3 Natural Gas - Reference 4 Reference 5 Reference 6 Reference 7 Reference 23	By the number of households	Reference 8 (Census Data)	Natural gas usage limited to A/Q region 008 and 009
Commercial Heating	Boiler/Furnace		By the number of employees	Reference 9 (Census Data)	Large variation of the sizes of establishments
Industrial	Boiler/Furnace		By the number of employees	Reference 9 (Census Data)	Large variations in the size of the establishments
Vessel Propulsion	Internal Combustion Engine	Diesel - Reference 10 Gasoline - Reference 10	By tonnage shipped	Reference 11	Residual oil, used on ocean going vessels, omitted.
Railroad	Internal Combustion Engine	Diesel - Reference 3 Reference 12	By miles of track	Map estimate	Reference 3 data do not include the Alaska Railroad
Motor Vehicles	Internal Combustion Engine	Diesel - Reference 10 Gasoline - Reference 10	By registration and miles travelled	Reference 13	Emission factors per Reference 15 Co - 310 lb/1000 veh. mi. HC - 48 lb/1000 veh. mi. NOX - 22 lb/1000 veh. mil.
Light Aircraft	Internal Combustion Engine	Gasoline - Reference 10	By gasoline sales	Reference 10	One LTO for every 10 gal. consumed per Reference 15. Emission factor per Reference 14.
Open Burning	Combustion	Reference 14	By population	Reference 8 (Census Data)	15 lb/capita/day refuse generation, ~0.75 lb incinerated and 6.75 lb open-burned. All disposal in A/Q region 008 by land fill.
Incineration	Combustion	Reference 14	By population	Reference 8 (Census Data)	
Solvent Evaporation	Dry cleaning losses	Reference 14 Reference 22	By population	Reference 8 (Census Data)	2.7 lb/capita/year evaporation losses
Gasoline Evaporation	Gasoline Marketing Losses	Reference 16	By automobile registration	Reference 13	20 lb/1000 gal. of thru put
Forest Fires	Open Burning	Reference 24	Estimate	Reference 25	923,078 acres burned (14 year average). 5 tons of lumber per acre.

TABLE 22 SUMMARY OF POINT SOURCE CALCULATION METHODOLOGY

POINT SOURCE CATEGORY	TYPE	BASIS FOR CALCULATION	METHOD OF CALCULATION	EMISSION FACTORS
Heating Plants	Boiler/Furnace	Questionnaire	EPA Computer Code	
Power Plants	Boiler/Furnace	Questionnaire	EPA Computer Code	
Food Processors	Boiler	Questionnaire	EPA Computer Code	
Diesel Power Plants	Internal Combustion Engine	Questionnaire	Hand Calculated	Reference 14 Table 15 Engines prior to '70
Natural Gas Flaring	Combustion	Reference 17 and Questionnaires	EPA Computer Code (17)	
Gas Engines/Turbines	Combustion	Questionnaires	EPA Computer Code	
Airports	Reciprocating and Jet engines	Reference 18 Reference 19 Reference 20 Reference 21	Hand Calculated	Reference 14 Table 17
Asphalt Batching	Particulates	Questionnaire	Hand Calculated	Reference 14 Table 70
Dry Cleaners	Vapor	Questionnaire	Hand Calculated	Reference 14 Table 21
Fuel Storage	Vapor	Questionnaire	Hand Calculated	Reference 14 Table 23
Ammonia Production	Process	Questionnaire	Hand Calculated	Reference 14 Table 26
Nitrate Fertilizer Production	Process	Questionnaire	Hand Calculated	Reference 14 Table 52

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